U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-255 268

PROCEEDINGS OF REGIONAL ENERGY EIS SEMINAR, HELD AT DENVER, COLORADO ON MARCH 6-7, 1975

DENVER FEDERAL EXECUTIVE BOARD

1975

PB 255 268

210067

PROCEEDINGS OF REGIONAL ENERGY EIS SEMINAR

COOPER H. WAYMAN
EDITOR

SPONSORED BY:
THE DENVER FEDERAL EXECUTIVE BOARD
DENVER, COLORADO
MARCH 6-7, 1975

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

P.H

BIBLIOGRAPHIC DATA SHEET	1. Report No.	2.	3. Recipient's Accession No. PB-255 268
4. Title and Subtitle PROCEEDINGS OF REGIONAL ENERGY EIS SEMINAR, HELD AT DENVER, COLORADO ON MARCH 6-7, 1975			5. Report Date 1975
			6.
7. Author(s) Cooper H. Wayman			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Denver Federal Executive Board, Colo.			10. Project/Task/Work Unit No.
			11. Contract/Grant No.
12. Sponsoring Organization Name and Address			13. Type of Report & Period Covered
			14.

15. Supplementary Notes

16. Abstracts

Because of the impetus of energy development projects in the Rocky Mountain area, a seminar was held in Denver, Colorado, on March 6-7, 1975, to address the multitude of environmental impacts (both on-site and off-site) that might result. The meeting was devoted to both technical and legal aspects of the problem. It specifically addressed problems in the energy-related environmental impact statement process.

17. Key Words and Document Analysis. 17a. Descriptors

*Meetings,
*Energy shortages,
*Environmental impacts,
Coal gasification,
Strip mining,
Oil shale,
Nuclear power,
Planning,
Energy policy,
Ecology,
Social effect,
Economic impact,
Legislation,
Regulations.

17b. Identifiers/Open-Ended Terms

17c. COSATI Field/Group

18. Availability Statement National Technical Information Service Springfield, Virginia 22161	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 174p
	20. Security Class (This Page) UNCLASSIFIED	22. Price 6.75/2.25

INSTRUCTIONS FOR COMPLETING FORM NTIS-35

(Bibliographic Data Sheet based on COSATI Guidelines to Format Standards for Scientific and Technical Reports Prepared by or for the Federal Government, PB-180 600).

1. **Report Number.** Each individually bound report shall carry a unique alphanumeric designation selected by the performing organization or provided by the sponsoring organization. Use uppercase letters and Arabic numerals only. Examples FASEB-NS-73-87 and FAA-RD-73-09.

2. Leave blank.

3. **Recipient's Accession Number.** Reserved for use by each report recipient.

4. **Title and Subtitle.** Title should indicate clearly and briefly the subject coverage of the report, subordinate subtitle to the main title. When a report is prepared in more than one volume, repeat the primary title, add volume number and include subtitle for the specific volume.

5. **Report Date.** Each report shall carry a date indicating at least month and year. Indicate the basis on which it was selected (e.g., date of issue, date of approval, date of preparation, date published).

6. **Performing Organization Code.** Leave blank.

7. **Author(s).** Give name(s) in conventional order (e.g., John R. Doe, or J.Robert Doe). List author's affiliation if it differs from the performing organization.

8. **Performing Organization Report Number.** Insert if performing organization wishes to assign this number.

9. **Performing Organization Name and Mailing Address.** Give name, street, city, state, and zip code. List no more than two levels of an organizational hierarchy. Display the name of the organization exactly as it should appear in Government indexes such as Government Reports Index (GRI).

10. **Project Task Work Unit Number.** Use the project, task and work unit numbers under which the report was prepared.

11. **Contract Grant Number.** Insert contract or grant number under which report was prepared.

12. **Sponsoring Agency Name and Mailing Address.** Include zip code. Cite main sponsors.

13. **Type of Report and Period Covered.** State interim, final, etc., and, if applicable, inclusive dates.

14. **Sponsoring Agency Code.** Leave blank.

15. **Supplementary Notes.** Enter information not included elsewhere but useful, such as: Prepared in cooperation with . . . Translation of . . . Presented at conference of . . . To be published in . . . Supersedes . . . Supplements . . . Cite availability of related parts, volumes, phases, etc. with report number.

16. **Abstract.** Include a brief (200 words or less) factual summary of the most significant information contained in the report. If the report contains a significant bibliography or literature survey, mention it here.

17. **Key Words and Document Analysis. (a). Descriptors.** Select from the Thesaurus of Engineering and Scientific Terms the proper authorized terms that identify the major concept of the research and are sufficiently specific and precise to be used as index entries for cataloging.

    (b). Identifiers and Open-Ended Terms. Use identifiers for project names, code names, equipment designators, etc. Use open-ended terms written in descriptor form for those subjects for which no descriptor exists.

    (c). COSATI Field Group. Field and Group assignments are to be taken from the 1964 COSATI Subject Category List. Since the majority of documents are multidisciplinary in nature, the primary Field Group assignment(s) will be the specific discipline, area of human endeavor, or type of physical object. The application(s) will be cross-referenced with secondary Field Group assignments that will follow the primary posting(s).

18. **Distribution Statement.** Denote public releasability, for example "Release unlimited", or limitation for reasons other than security. Cite any availability to the public, other than NTIS, with address, order number and price, if known.

19 & 20. **Security Classification.** Do not submit classified reports to the National Technical Information Service.

21. **Number of Pages.** Insert the total number of pages, including introductory pages, but excluding distribution list, if any.

22. **NTIS Price.** Leave blank.

TABLE OF CONTENTS

PAGE

PROLOGUE . . . . Cooper H. Wayman 1 - 3
EPA, Region VIII, Denver

WELCOME . . . . Michael J. Norton 4 - 6
Regional Administrator, GSA, Denver

TECHNICAL SESSION:

REMARKS . . . . John R. Quarles 7 - 14
Deputy Administrator, EPA, Washington, D.C.
"Environmental Concerns on Energy Development Programs"

. . . . Roland G. Robison 15 - 22
Deputy Asst Sec'y of Land & Water Resources
"Environmental Considerations with Respect to Energy Development Programs in the Rocky Mountain Areas"

. . . . Raymond L. Lowrie 23 - 30
Bureau of Mines, DOI, Denver
"Impacts from Coal Development"

. . . . William D. Shay, Jr. 31 - 42
Atlantic Richfield Company, Denver
"Impacts on Oil Shale Development"

. . . . Kenneth L. Ancell 43 - 47
Panhandle Eastern Pipeline Co., Houston
"Environmental Impacts of Coal Gasification"

. . . . Robert L. Pearson 58 - 64
Public Service Company of Colo., Denver
"Impacts Resulting from Nuclear and Conventional Power Plants"

. . . . Katherine Fletcher 65 - 72
Environmental Defense Funds, Denver
"Water/Energy in the West"

. . . . John S. Winder, Jr. 73 - 87
EIAS Pro.Institute of Ecology, Washington
"Ecological Considerations in the Preparation of a Regional EIS"

. . . . Jack S. Gilmore 88 - 96
Denver Research Institute, Denver
"Socioeconomic Impacts Coverage in EIS's

. . . . V. Crane "Vim" Wright 97 - 102
Colorado Open Space Council, Denver
"Problems in Preparation of an EIS -- from a Conservationist's Viewpoint"

table of contents (continued)

. . . . Daniel P. Baker 103 - 117
BLM State Office, Cheyenne
"Problems in Preparation of an EIS -- from a Federal Position"

. . . . J. Louis York 118 - 123
Sterns-Rogers, Inc., Denver
"Practical Problems in Preparation of a Regional EIS -- Consulting Engineer's Viewpoint"

. . . . LEGAL SESSION . . . .

. . . . Gary Widman 124 - 134
General Council, CEQ
"Program Impact Statements: CEQ Perspective"

. . . . Frank B. Friedman 135 - 155
Atlantic Richfield Company, Los Angeles
"Programatic Impact Statements"

. . . . Jack G. Collins 156 - 170
First Assistant U.s. Attorney, Portland
"Secondary Effects? - of Energy Development Projects"

PROLOGUE

Because of the impetus of energy development projects in the Rocky Mountain area, a seminar was held in Denver, Colorado, on March 6-7, 1975, to address the multitude of environmental impacts (both on-site and off-site) that might result. The purpose of the seminar was to provide a forum for individuals concerned with these problems to air their views. The meeting was devoted to both technical and legal aspects of the problem. It specifically addressed problems in the energy-related environmental impact statement process.

The first half of the technical session was chaired by Cooper H. Wayman, Director of the Office of Energy Activities, EPA, Region VIII, Denver, Colorado. This session presented, in very elegant fashion, the types of environmental impacts created from the potential development of energy resources related to coal, oil shale, coal gasification, and nuclear energy. An excellent paper was presented by Kathy Fletcher on water availability as related to energy development.

The second portion of the technical session was chaired by Frank Morison, Senior Partner in Holland and Hart Law Firm, Denver, Colorado. This session was devoted to problems caused in the area of socio-economics. In addition, two papers were presented on practical considerations in the preparation of an energy EIS.

Roger P. Hansen acted as Moderator for the legal session. This aspect of the seminar presented a status of the knowledge on legal actions on Regional Energy EIS, and specifically, programmatic impact statements.

The meeting was established as a result of one of the objectives of the Energy and Environmental Committee of the Denver Federal Executive Board. According to some of the speakers at the seminar, we need to view environmental impacts in terms of: (1) Regional geographic locations; (2) Specific sites; (3) Cumulative effects; and (4) Consecutive or serial effects. Those in attendance were reminded over and over again that no impact should go unobserved.

There are many ways to view the impacts of resource development as the different speakers presented their papers including:

SOCIAL - PHYSICAL
SHORT TERM - LONG TERM
POSITIVE - NEGATIVE
CRITICAL - NONCRITICAL
SEVERE - NONAPPRECIABLE
ON SITE - OFF SITE
CONSTRUCTION - OPERATIONAL

It was also pointed out by several speakers that statements on impact have perhaps underestimated the ecological assessments which should be built into a well documented EIS.

I think I would agree with Jack Gilmore of the DRI who spoke at the seminar that, "We are not data limited." We just need a better way to make materials available for use in EIS's.

In terms of direct acknowledgment of assistance given unselfishly in support of this program, the editor would like to pay his respects to:

John A. Green, Regional Administrator, EPA, Denver
Michael J. Norton, Regional Administrator, GSA, Denver
Dudley Faver, Regional Administrator, FEA, Denver
John R. Quarles, Deputy Administrator, EPA, Washington, D.C.

and last, but not least, all the subcommittee members of Objective V on the Energy and Environment Committee who gave very generously of their time to make the meeting a success. I would be remiss if I did not recognize the outstanding assistance rendered by my able secretary, Lucille Johnston.

Cooper H. Wayman
Editor

REGIONAL ENERGY ENVIRONMENTAL IMPACT STATEMENT SEMINAR
Holiday Inn Downtown
Denver, Colorado
March 6 - 7, 1975

Remarks by Michael J. Norton

Energy and Environmental Action is a national priority objective established by the President for Federal Executive Boards across the nation. We are all aware of the recent worldwide developments which have made energy of critical importance to the United States. President Ford's State of the Union Message outlined our economic and energy situation and described the actions he proposed to the Congress for dealing with those problems as well as setting new directions necessary to avoid a recurrence of problems in the future.

Many of the solutions to this energy problem rest here in the West and you'll be discussing them today and tomorrow. It's become increasingly obvious, however, that concerns for the environment cannot and should not be cast aside in a crisis effort by the Federal Government, or anyone else, to increase energy supplies.

It is also obvious that Federal decisions relating to this area must be made in consultation and cooperation with state and local governments. That's why some of our top Federal leaders from Washington are here today and have been frequent visitors to this Region.

We must analyze how we impact on local or state land use plans or zoning requirements or the needs, desires, and wishes of the state or locality in which energy resources are developed.

We cannot run roughshod over local communities using supremacy of Federal Government as rationale. Except, to the extent unreasonable state or local standards exist, we as Federal agencies should comply.

We all must recognize that environmental concerns have falsely been used as the whipping boy. In reality, energy development and environmental concerns go hand-in-hand.

With respect to energy, the U.S. remains vulnerable to the economic and social impact of an oil embargo. Domestic oil production continues to decline--I'm not sure anyone has accurately assessed the potential declines in domestic oil production if the oil depletion allowance is eliminated--and other domestic energy sources are not increasing fast enough. Overall, energy consumption is beginning to rise again. Oil imports are rising to fill the gap between domestic energy demand and supply. I'm sure you've all read the statistics that the U.S. paid foreign oil producing nations $25 billion in 1974 compared to about $3 billion in 1973. This means a loss in both jobs in the U.S. and America's dollars.

We have long followed, without serious thought, the practice of satisfying all energy demands at the lowest possible prices. Generally low prices for all energy sources in the U.S. have contributed to high demand. A prime example is the artificially low natural gas prices that have resulted from Federal price regulation and caused declining U.S. natural gas exploration and production and growing shortages.

I know that many of these concerns will be discussed at the conference. It is a well-planned coordinated approach, and Regional Administrator Jack Green of the Environmental Protection Agency, as well as Cooper Wayman who put your program together, are to be congratulated. My best wishes for a successful conference.

Remarks by John R. Quarles, Deputy Administrator
Environmental Protection Agency
Washington, D. C.

. . . . . business since Karl Marx and I think sometimes we in the environmental field are viewed in that light. I don't think we should be. This country is confronting profound problems in the energy field and in the total relationship of our economic growth and national development to the national resource base on which that economic development and activity must be based. Those of us in the environmental movement have been among the first to identify and speak out about them. I count myself as a newcomer to that group, even though the last five years it's been most of my life. The problems have been building for a lot longer period of time than that, and some farsighted environmentalists have been ahead of everyone else in recognizing them.

Whether we can solve these problems in this country remains to be seen. I don't believe that we're right at the edge of going off the cliff, but I do believe that we are seeing danger signals that must not be disregarded. The types of changes in activity which are going to be required to put us back on a sound footing will not be easy to make, and the more that we struggle with the problems, the more difficult they seem. In this country we have always gone at resolving difficulties by seeking the technological fix. If we could just push technology a little bit harder, we would eliminate the immediate problem and keep on going with the ever-rising national growth, improvement in standards of living, more material benefits to all. But now we really are facing a group of signals that suggest that perhaps the technological fix is not in and of itself the answer.

I thought as I prepared for coming to this occasion how fitting it might be to tell a story from West Virginia that possibly a few of you have heard. It involves a couple who had lived for years on a backwoods farm near Oozley Hollow, West Virginia--John and Mandy. They had for years and years aspired to own a striking clock. They saved what little money they could by selling an occasional extra chicken or some of the moonshine that John periodically made. They put the money in a jug and finally accumulated enough so that John could get on the train and ride to town and buy a fancy striking clock, which he brought back to his home. He and Mandy were so excited to have this striking clock finally in their house. Every fifteen minutes it chimed and every hour it rang out the hour. When nightfall came, they said, "Ya know, we can't just go to sleep and have this clock sitting around - there'll be no one to hear it. It sounds so beautiful, one of us must stay up and listen to the clock." So Mandy stayed up all night long and listened to the clock. The next morning they got up and they went about their day's activity and then the next night John agreed to stay up and listen to the clock and Mandy went to bed. Each fifteen minutes the clock struck and John sat there in his rocking chair with a little fire and listened to it and just enjoyed that clock. It got to be a quarter of twelve, midnight, then it got to be midnight itself. The clock started to strike. It struck one, two, three up to twelve, but then it kept striking -- thirteen, fourteen, fifteen, sixteen, seventeen, eighteen -- it just kept striking. John didn't know what to do. He ran to the bedroom and he said, "Mandy! Mandy! Come on, get up! We got to get out of here! It's later than I ever knowed it to be before!"

Sometimes I think that in the problems of the energy crisis and the environment it is later than we've ever knowed it to be before. The efforts that the Federal Executive Boards are making to push for energy conservation in the Federal Government are important in making up for lost time. I attended a breakfast the day before yesterday in San Francisco, also at which I talked to the Federal Executive Board on this very same subject. These meetings and the Board's work are taking place around the country and it is a good beginning.

Other efforts also are being made, but my own judgment is that the start is much too slow. We are not really biting into energy consumption with the intensity that is required if we're going to bring an appropriate balance to our production-consumption ratio. Energy imports continue to be high, as Mike Norton mentioned, and we cannot stand the strain of the financial burden imposed by purchasing all that oil from the Middle East. Our balance of payments outflow, which was in the range of $4 billion a year from imports of oil three or four years ago, has risen to $25-$26 billion a year now. That is too much. It is a material aggravation for an economy that is already under deep stress. Only by ratcheting the screws down on our energy conservation will we be able to reestablish a balance that we can live with over an extended period of time. I'm not going to dwell on this, because I know it is not the predominant purpose of this session, which is to focus more on the Environmental Impact Statements that relate to energy production projects.

In that connection, I think that anyone who has looked at the problem thoughtfully and carefully must come to the conclusion that the energy problems of this country require a dual approach of energy conservation on the one hand and all reasonable efforts to expand energy production on the other. The most difficult issues to resolve are those of what are "all reasonable efforts to expand energy production." In my own mind, the issues fall into two categories. One group of concerns focuses on what permanent sacrifice of our environmental quality and natural landscape we are prepared to make for continuing high energy production. We do need to recognize that energy production does, for the most part, entail some unavoidable degree of environmental damage which must be accepted as the price that is paid, if you want to have the energy. The judgment of the country has always been yes, we want the energy, and usually the judgment of the country has been we want it irrespective of the cost. The degree of sacrifice of the mountainsides, the plains, the quality of air and the quality of water which we are willing to accept because we believe it is more than offset by the benefits of our standard of living for ourselves and our children -- that is the issue. That issue bears directly on the energy conservation problem, because if we fail to push ahead with energy conservation, then we're headed in the direction whose implications are inescapable though they may not be obvious and may not be immediate.

The other question is, the degree of reduction that can be made in environmental damage incurred in connection with energy development if the proper attention is paid in advance. Here is really the more controversial, more difficult, more immediate problem -- and the one which really can be tackled with some real benefit. If one looks at the type of difficulties that have accompanied the Jim Bridger development, for example, or other problems here or in other parts of the country, it's obvious that developing energy without proper planning imposes horrendous burdens that we should not accept. From the environmental side of this, I will say as far as EPA is concerned, we will not accept this much damage, at least not until we have exhausted every resource we have to prevent it. I hope this will not occur, and with the right planning it can be avoided.

I think that's what you are here to try to work out. What types of data must be collected? What types of analyses should be made? What types of technological controls should be insisted upon? We must insist on planning requirements and construction practices to hold down the pollution, to minimize the disturbance of the surface of the soil. Locations for energy development must be carefully selected, and we must assure that there will be sound community planning for the communities that will spring up as massive energy-development projects are launched. This is not easy, but it can be done if we will really get hustling and face these issues frankly and plan for them. And I think that is the task that can be performed most effectively through the Environmental Impact Statement process.

The Environmental Protection Agency wants to participate in this process, as evidenced by Cooper Wayman's participation in this program and Jack Green's presence here. I hope that the entire record of our activity in this Region and elsewhere in the country also gives evidence of our willingness to participate. We want to participate in a way that is constructive, and I hope that all environmentalists share that approach. We should not stand in opposition as a matter of principle to any type of development. We should stand in opposition as a matter of principle to unplanned energy development.

Today and in the weeks and months ahead I think you'll be trying to come down off the mountaintop of generalities and grapple with the hard issues of what they really mean. I think probably there are many here who are better equipped than I am to lead you in a discussion of that. So I won't say more except that we do need to work together. We are not in conflict or we should not be in conflict. We are in the same boat together, and if ever that wasn't understood in the past, it should surely be clear now. The energy crisis and environmental problems all combine to teach us that we have but one world to live in, and we'd better do what we can to make it well preserved and carefully protected.

REMARKS OF THE HONORABLE ROLAND ROBISON TO THE REGIONAL EIS SEMINAR, DENVER, COLORADO, MARCH 6, 9:00 A.M.

The leading character of "Teahouse of the August Moon," the Okinawan peasant philosopher Sakini, opens the play with these words:

> "Not easy to learn.
> Sometimes painful.
> But pain makes man think.
> Thought makes man wise.
> Wisdom makes life endurable."

I need not dwell long on the pain of our present national situation. All of you are aware of the general slowdown of our economy, and of the simultaneous inflation and recession we are currently suffering.

The Arab oil embargo and the subsequent quadrupling and quintupling of oil prices can be measured in terms of the severe blow they have dealt our economy, and in terms of their impact on human lives.

One million American jobs have been lost, primarily as a result of the energy crisis. In 1974 the United States paid out $25 billion for oil imports. This was the major contributor to an $18.5 billion negative trade balance, the second highest in our history. It is estimated that to establish one job in industry requires about $12,000 in capitalization. The $25 billion that flowed out of this country last year could have capitalized 2 million jobs.

To reduce the Nation's vulnerability to the kind of economic warfare the OPEC nations are waging, the President has set the goal of cutting our dependence on foreign energy sources.

More than 90 percent of our energy comes from the traditional fossil fuels, but domestic supplies of oil and gas, which supply 70 percent of our energy needs, are being consumed at high rates. Identified domestic petroleum reserves will last just a few more years unless new discoveries are made. At 1972 production levels, only eight years of proven reserves for oil and eleven years for gas remain.

Strenuous efforts to reduce the growth of energy consumption will be required. But even if we reduce this growth rate to approximately half of what it was in the 1960-1970 period, we shall still be short of domestically-produced energy.

That is why, as a matter of national policy, the Administration is turning to coal. Coal represents 88 percent of all known U.S. fossil fuel reserves. Theoretically, coal could supply all of our energy needs for more than 400 years. Of the more than 3.2 trillion tons of estimated coal resources in the United States, 40 percent is federally-owned, and much of this is in the West.

The question arises: Can western coal be leased and developed within acceptable environmental limits?

Two factors make these Federal coal resources attractive from an environmental standpoint: first, the thickness of the seams and second, the low-sulfur content of most western coal. Western coal fields have an exceptionally high yield per acre. In some places seams will average 70 to 90 feet in thickness. This naturally makes for higher yields per acre of surface land.

For example, in the Powder River Basin in Wyoming the Wyodak seam averages about 122,000 tons of coal per acre. Compare that to the 3 or 4 foot thickness of coal deposits in Appalachia, which will yield 7,000 to 10,000 tons per acre. Western yields are 8 to 12 times as high per acre.

This high yield per acre translates into 8 to 12 times less land disturbed for a given rate of coal production. It also means that proportionally more money per acre can be spent on reclamation efforts. My second point, the low-sulfur content, means lower sulfur dioxide emissions when the coal is burned. In addition, the low-sulfur content reduces the problem of acid mine drainage which has plagued eastern mines.

Attractive as western coal may be, from both an economic and an environmental standpoint, the Federal Government has not been stampeded into wholesale and uncontrolled development of these resources. Quite the contrary.

In late 1970 the Department of the Interior discontinued coal leasing so that an analysis could be made of the entire situation and a rational coal leasing program developed. In February 1973 Secretary Morton made a formal policy statement discontinuing the processing and acceptance of all prospecting permit applications. He established short-term leasing criteria to allow for the granting of leases under emergency conditions, either to keep a mine going or to provide for reserves needed to support short-term operations.

Since February 1973 only four short-term leases have been let under the Secretary's criteria. Two of these were in the West, one in Utah for 1,350 acres and one in Colorado for 241 acres.

The moratorium on coal leasing has been maintained, pending the development of a new coal leasing program that will permit maximum protection of the environment and rational land-use planning.

Presently about 16 billion tons of federally-owned coal are under BLM issued leases and an additional 12 billion tons are under preference right lease application. The topography, weather, soil, geology, fauna and flora of the areas vary tremendously. They include the plains of North Dakota and eastern Oklahoma, the rolling grasslands of Wyoming, Montana and Colorado, and the arid basins of New Mexico and Utah.

Development of the federally-owned coal reserves will not take place until a satisfactory leasing program can be implemented. The long-range aspects of the Secretary's leasing policy provide for the development of an environmental impact statement on the Department's entire coal leasing program, the so-called 'coal programmatic." His policy also provides for the development of a planning system to determine the size, timing, and location of future coal leases in order to meet the Nation's energy needs most effectively.

Because of the growing need for domestic fuel resources and the need for a managed leasing system with adequate environmental safeguards, it has been necessary to develop a flexible new leasing program acceptable to both environmental and private industry interests. We call this program EMARS. EMARS is an acronym that describes the way that industry and public nominations are incorporated into BLM's multiple-use planning system. EMARS will allow the Bureau of Land Management to lease those areas of federally-owned coal where there are the highest development interest and the lowest environmental costs.

In analyzing existing coal leases in six western States, we found that, as I mentioned before, there are 16 billion tons of recoverable reserves under lease. But 2 billion tons of this coal is considered to have no development potential because of extreme environmental problems. Thus we are left with 14 billion tons, and roughly half of this is already under development or committed to future use.

To accelerate development of the remaining 7 billion tons under lease, the Department has published, as proposed rulemaking, diligence requirements. Leaseholders, under these regulations, must commit the lease to a logical mining unit within two years and report biennially what is being done to diligently develop the lease.

Under the proposed EMARS program all preparation for leasing will be done through the BLM's land-use planning system. Basically this is a system of analyzing each resource potential for a given unit of land, a look at its wildlife, soil conditions, recreation potential, etc.

There will be a series of overlays showing, first, the coal resource, as identified and classified by BLM and the GS. Superimposed on this display of the coal resource will be displays of other resource values. For example, one overlay might show the migration route of a herd of mule deer; another might show the existence of an archeological treasure; a third might show a water resource that must be protected.

The first phase of the EMARS system is the nominations and programming phase. At this point BLM receives industry and public nominations of areas of desired development and areas that should be protected. These nominations are given the fullest consideration in the decisionmaking process.

In the second phase, BLM's District Office will inventory the mineral resources and conduct the appropriate environmental analyses. Environmental impacts and tradeoffs will be identified. These tradeoffs are part of BLM's Management Framework Plan. The tradeoff decision is documented and possible coal leasing areas will be identified. Nominations for leases will be processed only after the planning has been completed.

The District Manager then recommends proposed tracts for leasing. A schedule of lease sales is prepared and announced well in advance. This procedure complies with the National Environmental Policy Act by documenting the resource tradeoffs and by considering the alternatives when the decision is made.

In the third, or leasing phase, the State BLM Office reviews the pre-sale evaluation made by GS and specifies environmental stipulations, together with bonding requirements. After the sale, a post-sale evaluation is completed and the final lease may be issued.

Let me review the specific areas of public participation under the EMARS system:

- States and local governments and private groups may recommend areas or specific tracts to lease or not to lease.

- They may participate in the land use planning procedures, during the data gathering phase, in the preparation of Management Framework Plans, and by commenting on the final land use plan.
- They may, and certainly have, participated in the technical examination under 43 CFR 23 to develop environmental stipulations.
- They may submit data and recommendations on both draft and final (site-specific) EIS's.
- They may review and comment on proposed regulations affecting the program.

During mining operations, periodical compliance checks by the GS and BLM assure that the lessee is upholding the terms of the lease, including any environmental tipulations. The lessee is required to submit a yearly operations report, which includes a report of coal extracted and of reclamation efforts. When operations cease, the GS and BLM review for compliance with all regulations.

In the Office of the Assistant Secretary for Land and Water Resources we have taken a fundamental policy position. It is that in considering any of the Nation's natural resources under our jurisdiction we will give equal priority to protection of the resource base and to extractive uses. In formulating this policy we have moved from a reactive position to a policy of total resource management, a policy of Federal responsibility for fair and wise development of public resources.

The Environmental Protection Act brought a new dimension to planning in America and the Nation is certainly better off for this new focus as planned development. The Environmental Impact Evaluation program, we believe, was not intended to precipitate confrontation between the forces of ruthless and uncontrolled development and the forces of zero growth and total preservation. It was not designed to answer the question of whether or not resources should be developed. Rather, it is intended to determine how resources should be developed, in what areas they should be developed, and in what areas they should not be developed.

As Secretary Morton has often said in recent weeks, I do not believe that we are stuck with an either/or situation. We can move to develop the resources required to meet our national needs. The question is "how." One of the great values of meeting together, as we are doing here today, as to learn together how we may proceed. As Sakini observed,it is not easy to learn. It is sometimes painful. But if that pain causes us to think and out of the thinking we achieve wisdom, this dialogue will have been eminently worthwhile.

Impacts from Coal Development--Strip Mining and Reclamation

by

Raymond L. Lowrie

Note: This paper as presented at the March 6th meeting was supported by 36 color slides depicting strip mining situations and solutions. The slides could not be reproduced in these Proceedings, making it necessary to revise the text, somewhat.

Strip mining is the topic of this talk because the preponderance of coal tonnage projected for the West in the foreseeable future will be produced by that method. The reasons for this are that, in comparison to deep mining, strip mining is cheaper, safer, and yields a much higher recovery percentage of coal per unit of area, and also can be developed much faster. Furthermore, deep or underground mining of many strippable deposits in any extensive way is impracticable if not impossible with current technology. This is because strippable deposits are near the surface, and in the West relatively thick, which make the overlying dirt and rock strata susceptible to collapse. Subsidence and associated hazards are almost certain.

Strip mining, however, can create a wide range of environmental problems, and thus has become anathema to many concerned citizens. Strip mining has earned a bad reputation because of bad practices, just as has clear-cut logging in rough terrain or clean tillage on erodible soils.

This concern is particularly evident in Appalachia where environmental impacts from strip mining have been severe on the land, water, and aesthetics, and,to a lesser degree, on the air.

The real impact on the air, however, comes when high-sulfur coal is burned and oxides of sulfur and fly ash are emitted from power plant stacks. Regulation of these impacts has caused strong interest in Western coal deposits, which characteristically are of lower sulfur content.

Immediately in the wake of the quest for low sulfur coal came the energy crisis, which focused new interest on Western coal with its potential to substitute for other fuels under boilers, and in gasification and liquefaction processes.

The high level of interest in the vast Western coal deposits has caused our society to look critically at the environmental impacts of the development that is taking place today and is likely to take place on a massive scale in the future.

Underground mining techniques applied to near surface deposits, now classified as strippable, also have serious impacts. Both Wyoming and North Dakota have areas of partially collapsed landscapes from such mining. The areas are characterized by rows of depressions, holes and high places on the surface. Pillars of wasted coal in the mine support the high places on the surface. The result is the worst of situations--a recovery percentage of coal that is grossly wasteful and a ruined or seriously impaired and dangerous surface.

Strip mining, to be sure, can bring havoc to the surface. Many areas without reclamation would be useless for most purposes for the entire lifetime of everyone living today.

But that need not be the case. Reclamation of the land to a beneficial future use and the prevention of damaging off-site effects can be and is being achieved across the land under legislation and/or a land ethic which requires reclamation as part of the mining sequence, and paid for by the sale of the coal.

Numerous State legislatures and the Federal government have moved and are moving rapidly to set forth mandatory requirements in this regard. For example, the State of Ohio passed a strong and comprehensive strip mine law in 1972, as have many other states such as Pennsylvania, Montana, Wyoming, New Mexico, and others. Early reclamation laws were often minimal and inadequate. Frequently only the tops or ridges of the spoil banks were leveled; and revegetation consisted of planting trees. Cliff-like highwalls were left behind, and the aesthetics of many areas were seriously impaired. Land-use both above and below highwalls was negligible for some distance because of the hazard of a precipitous drop and the instability of the ground. Such reclamation is a thing of the past in most parts of the country.

My talk will emphasize Ohio strip mines because of my recent experience as the State government official responsible for enforcement of the strip mine law and reclamation in that state. This came about when Ohio requested assistance from the Bureau of Mines in implementing and enforcing its strip mine law. The Bureau of Mines assigned me there for two years under authority of the Intergovernmental Personnel Act, and I returned to Denver only this January.

Obviously there are some differences in strip mining and reclamation in Ohio as compared to the West. But there are also many similarities, especially in the scale of operations--as we now know them. To date in the 1970's, Ohio is the second largest producer of strip coal in the country, being exceeded only by Kentucky. Also, the terrain in Ohio is not usually as steep as most of the Appalachian strip mining areas. Furthermore, conditions and problems vary almost as much as between those in the Desert Southwest and the Northern Great Plains.

In general terms, differences between Ohio and the West are (1) the weather--Ohio receives far greater precipitation and less wind, (2) the character of the overburden and coal--certain strata in spoil in Ohio tend to be acid and toxic because of sulfur, compared to alkaline and toxic because of sodium in the West, and (3) physical differences in the thickness of the coalbeds--greater bed thicknesses in the West result in less spoil material than is needed to completely backfill the pit at some mines whereas there is an excess of spoil material in Ohio because the swell of broken rock exceeds the thickness of the coal removed.

O.K., what are we now talking about when we speak of strip mines, environmental problems, draglines, shovels, pan-scrapers, dozers, inadequately reclaimed lands, off-site problems, and good reclamation? We are talking of controls and changes in philosophy, and the use of machines that make for mitigation of the environmental evils, while yet producing the coal necessary to power the Nation's industry.

Strip mining and land reclamation are achieved by using machines controlled by man. In Ohio, the action begins with clearing brush and timber from the land to be mined. If the timber has value it is marketed. Otherwise, bulldozers push the vegetation aside for later burial in the pit.

Removing and stockpiling surface soil with scrapers and/or bulldozers follows. Bulldozers are generally used where the haul is short. As the haul lengthens, scrapers are more economical because of the capability to carry excavated material instead of pushing it. Scrapers of all types, styles, and capacities are used and are the same as equipment used in constructing highways and earthfill dams. Two types in use are push-loading and self-loading. Push-loading and regular self-loading scrapers load the material by the force of the forward movement and have a heaped capacity of up to 54 cubic yards. Self-loading scrapers may have an elevating device, and have heaped capacities up to 35 cubic yards. When the grade is too steep or the material too hard, self-loading scrapers often require a push from a tractor or bulldozer.

After the surface soil has been removed, stripping the overburden begins. However, unless the material is soft or friable, overburden must first be drilled and blasted. Overburden is removed with bulldozers, scrapers, front-end loaders, shovels, and draglines. Also, bucket-wheel excavators are being used in Illinois. Large shovels and draglines are often used at large operations because of economies of scale.

The largest land machine in the world is "Big Muskie" of Ohio Power Co. It is a dragline as distinct from a power shovel, and weighs 30 million pounds. A dragline sits on the highwall and drags the bucket and its load toward the machine. Its boom is 320 feet long, longer than a football field. Its bucket is 220 cubic yards in size, and would contain six average-size apartment bedrooms. The machine has more than twice the earthmoving capacity of any dragline in the West. "Big Muskie" can easily mine to a depth of 200 feet.

Another machine is a power shovel. The "Silver Spade" of Consolidation Coal Co. has a dipper 105 cubic yards in size, and a boom length of 200 feet. Such a shovel sits down in the pit and fills the dipper by scooping upward to remove the rock.

Yet other such machines are the 70-yard dragline called the "Broken Aro" of Peabody Coal Co., and the "Mountaineer," a 60-yard shovel of Consolidation Coal Co.

Following the removal of overburden, the surface of the coalbed is cleaned; then it often is broken for loading by drilling and blasting. Broken coal is loaded with a smaller shovel or front-end loader into haulers with capacities as great as 200 tons.

After a cut is made to expose coal to mining, the waste or overburden spoil from subsequent parallel open cuts is placed in the previous cut, and at this point the reforming of the new surface is begun.

Land reclamation is environmental protection and is most important. It begins with planning and is not finished until some time after the mining has been completed. Before mining begins, drainage control is planned to prevent erosion and water pollution. Drainage systems must be designed to prevent siltation, acid water formation, and leaching of alkaline salts. Water treatment frequently is required. Drainage must also be designed to prevent erosion during and after mining and reclamation. Discharge channels often should be riprapped.

Overburden must be placed so that all debris and toxic material are buried and remains buried after the mined land is graded. On sloping terrain, overburden must also be spoiled or placed so that landslides will not occur. Natural ground can give way and slide if the slope above is overloaded with spoil.

The chief source of air pollution from a mining operation is dust from haul and access roads, and that produced in removing vegetation and topsoil, drilling and blasting, and in moving and placing the spoil. Dust can be prevented or reduced. Haul and access roads can be sprinkled. Land cleared in advance should be kept to a minimum and wetted as necessary; and spoil should be graded closely behind mining. The trend in drilling is toward the use of air instead of water for removing cuttings from holes. Dry cuttings are a potential source of dust, but drills can be equipped with collectors so that dust will not escape to the atmosphere. Blasting can be controlled so that only minimal dust is emitted. Explosive energy is wasted when blast holes erupt like geysers or when blasted material is thrown helter-skelter. Vibration from blasting can be reduced by the use of milli-second delays to minimize or eliminate damage to nearby structures. This should not be a problem in the wide open spaces of the West.

Reduced aesthetic values and hazards owing to greatly disturbed topography can and are eliminated by grading. This is particularly a problem with the precipitous slope of the highwall which must be backfilled with spoil to produce a stable grade that blends well with the surrounding terrain. It must be emphasized that there are problems with original contour reclamation, particularly on steep and long slopes where erosion rills can form and become gullies if corrective measures, such as adequate diversion ditches, are not taken. Grading the spoil is the first step of aesthetic value improvement.

After grading is completed and soil material replaced, revegetation must promptly follow. The type of vegetation is dependent upon the climate and post-mined land use. Where precipitation is inadequate it may take more than one growing season after planting to establish a ground cover, but, with original soil in place and surface water run-off controlled, it can be done.

This is what reclamation at strip mines is all about. There are problems remaining, to be sure, but great strides have been made technically, philosophically, and legislatively in the last few years.

People no longer have to suffer some of the bad practices and abuses that have been known to occur in the past.

THE IMPACTS OF OIL SHALE DEVELOPMENT

William Dixon Shay, Jr.
Attorney, Atlantic Richfield Co.

I. INTRODUCTION

Those of you who expect to achieve a full understanding of the impacts of oil shale development within the next 20 minutes are in for a disappointment. My inability to furnish you with such an understanding is attributable to several factors.

First, 20 minutes is insufficient time to summarize the complex social, economic and environmental impacts of this potential industry. A team of authors working for the Bureau of Land Management, for example, has been wrestling with the preparation of an environmental impact statement summarizing the environmental effects of the operation of a single plant for the past nine months.

Second, the "industry" I will be referring to exists only on paper. Oil shale projects are quite sensitive to the price of crude oil. Because of historical declines in the price of crude oil, the birth of the industry has been postponed several times. As a result, mining methods and retorting technology sufficient to produce commercial volumes of shale oil are still in various stages of preliminary evaluation and testing. None of these methods has been devoted to commercial operation. Any discussion of the potential impacts of this embryonic industry has to be highly conjectural. It is extremely difficult to predict whether the "industry" will consist of one, five, or ten plants by 1985, or 1990, or merely be limited to additional research and development activity similar to that which has been conducted for the past 50 years.

Third, there is no unanimity of opinion as to which retorting method provides the most effective means of recovering oil from shale. At the present time at least three basic processes are being evaluated for commercial development. The Bureau of Mines, Union Oil Company, and the Parahoe group have been testing alternate, above-ground gas combustion processes. The Oil Shale Coroporation has developed a separate process consisting of solid to solid heat exchange between preheated shale and hot ceramic balls. Garrett Research and Development Company, a subsidiary of Occidental Petroleum, has been experimenting with an in-site process which involves fracturing and retorting huge columns of shale in place by means of controlled underground fires. The environmental impacts of each of these processes differ substantially. It must be kept in mind, therefore, that the cumulative impacts of the industry will be a function of the mix of retorting processes used by its constituent plants. At the present time, it appears that the Tosco II process will be used at the Colony Development Operation site in Garfield County and at Federal Lease Tracts C-a and C-b in Rio Blanco County. This process has been successfully tested at a semi-works facility 47 miles north of Grand Valley, Colorado, and is ready to use in a commercial shale operation. It is likely, therefore, that the character of impacts resulting from the early phases of industry growth will be dominated by the types of impacts which are expected to result from the Tosco II process.

Fourth, because of local variations in the depth of overburden above the more valuable zones in the defined reserves, a variety of mining methods will probably be used to recover raw shale ore. Whereas the Colony and Tract C-b projects will most likely employ a subsurface room and pillar method, the C-a project will probably resort to strip mining. Obviously, the impacts which could result from these methods should be quite distinct.

Because of the existence of these variables, it is not possible at the present time to develop reliably definitive analyses of the specific impacts of the industry. The remaining portion of this presentation will, therefore, be directed to general observations regarding the most significant type of impact which may occur when and if the industry becomes a reality.

II. GENERAL PRINCIPLES OF SHALE OIL PRODUCTION

An essential prerequisite to a discussion of the impacts of oil shale development is an understanding of the basic principles of shale oil production. All of the retorting processes mentioned previously have a common purpose which is related to the unique chemical and physical properties of the rock which has been colloquially identified as "oil shale". Oil shale consists of a solid hydrocarbon called kerogen locked within a marlstone matrix. The kerogen found within the rocks of the Green River Formation is the end product of the same processes of sedimentation, geology, and chemical change which are believed to result in crude petroleum - the distinction being that the kerogen has been subjected to less heat and pressure. When the rock is heated to approximately 900° F., the kerogen decomposes to yield hydrocarbon gases and liquids. This process of heating and decomposition is called pyrolysis. Most of the vapors are then condensed to yield shale oil. The common purpose of all retorting methods, therefore, is to heat the shale to sufficient temperatures to induce pyrolysis and then to collect and condense the products of this process.

The direct heat retorting methods, either above or below ground level, consist of fracturing or crushing the shale to facilitate heating and subjecting the exposed shale surfaces to direct combustion sufficient to produce pyrolysis temperatures. Indirect heating methods consist of inducing the same temperatures by mixing heated shale with some other preheated solid. Above-ground processes require some form of mining and crushing activity prior to pyrolysis.

III. IMPACTS RESULTING FROM DEVELOPMENT

For purposes of this presentation, I have grouped by remarks according to impacts upon significant physical components of the environment, including air quality, hydrology, geology, and land use and impacts upon significant biological components of the environment including flora, fauna, and the human environment.

A. Impacts Upon the Physical Environment

1. Air Quality

Impacts upon air quality will result from construction and mining activity, retorting operations, and offsite development.

a. Construction

The generation of fugitive dust, particulates, and miscellaneous pollutants at construction sites and from construction-related traffic will be temporary in nature and therefore insignificant over the life of individual plants.

b. Mining Activity

Oil shale mines will be a permanent source of particulate emissions and fugitive dust as well as miscellaneous pollutants related to blasting activities and the use of diesel powered mining equipment. The amounts of contaminants actually produced will depend upon the dust suppression methods employed by each operator both within and without the mine and the extent to which catalytic scrubbers are used on mining equipment.

c. Retorting

Kerogen contains organic sulfur compounds which break down during pyrolysis. Depending upon the retorting process employed, this sulfur will end up in varying concentrations in both the gaseous and liquid fractions of the retort product. Whenever and wherever these gases and liquids are burned, the sulfur will be released in the form of sulfur oxides as a product of combustion. The amounts of sulfur oxides emitted will depend upon the use and effectiveness of each operator's off-gas sulfur removal process and shale oil hydrotreating facilities. Operators will have two basic options - to install sulfur removal equipment at the retorting site or to transport the sulfur-bearing gas and liquids to other facilities equipped to reduce the sulfur content to desired levels. Similar measures must be taken to reduce sulfur levels in gases or liquids used as plant fuel to ensure compliance with local air quality laws. Colony currently plans to hydrotreat shale oil at the plant site and to reduce sulfur levels in plant fuels, as necessary, to meet federal and state emission limitations and ambient standards in effect during plant operation.

d. Off-site Development

Depending upon the amount of additional population induced to areas of active development, there will be additional emissions of contaminants from vehicles, residences, and areas of secondary industrial and commercial development. Because of the tentative status of the industry at the present time, it is extremely difficult to make any meaningful projections about the significance of this potential source of air pollution. Estimates prepared by consultants for Colony indicate that the increments of various comtaminants which can be expected to result from anticipated off-site development related to the operation of the Colony plant will not violate applicable federal and state laws.

e. Conclusion

Ultimately the degree of air pollution which results from the industry will be a function of federal and state enforcement policy. Broadly interpreted, existing federal and state regulations could be used to freeze growth and to prevent any further deterioration in air quality. At the present time, for example, Colorado's air quality regulations include an ambient standard for sulfur dioxide which is at a level equivalent to the threshold measuring capacity of contemporary sampling equipment. Unless this standard is relaxed in its application to the Piceance Basin, it could be used to severely restrict the growth of the industry and to frustrate the purposes of the federal prototype oil shale leasing program. As indicated by this example, the degree of air quality deterioration which will ultimately result from the industry will be far more substantially influenced by state legislators and control agencies than by the operating methods employed at each plant.

2. Hydrology

The growth of a multi-plant industry could have a substantial impact upon regional surface and subsurface hydrology. Although requirements for water and characteristics of effluent vary according to each retorting process, certain conclusions can be drawn about the cumulative impacts of a full scale industry.

a. Pollution of Surface Water

There will be a significant potential for pollution of surface water from a variety of sources. The application of any of the above-ground technologies will produce varying quantities of polluted water which is an inherent by product of pyrolysis. "Retort water" contains a variety of pollutants including phenols, ammonia, sulfate, various acids and other pollutants. According to the Final Environmental Impact Statement prepared by the Department of the Interior prior to the federal leasing program, depending upon the process used, retort water could be produced at a maximum rate of 10 gallons of water per ton of shale. An average rate of two to five gallons per ton is expected. For plants equippped with hydrotreating facilities, additional amounts of water will be required in the stream retorting process to make hydrogen and for use as cooling water. Process water containing a variety of pollutants will be produced during these operations. Additional quantities of water will be used to insure proper compaction densities of spent shale during disposal operations, for dust suppression, and to irrigate processed shale embankments in connection with revegetation programs. Runoff water from spent disposal areas is expected to contain varying concentrations of salts, metallic elements and miscellaneous pollutants.

In addition, sewage and municipal waste water will be produced as an inevitable result of off-site development. Without treatment, the discharge of this water could lead to serious water pollution throughout the region. Once again, however, the requirements of existing federal and state water pollution controls, as implemented through the NPDES permit system, are adequate to prevent any significant deterioration of surface water quality as a direct result of discharges from oil shale retorting and mining complexes or related off-site facilities. It should be noted that the goal of the Federal Water Pollution Control Act Amendments of 1972 is to eliminate all discharges of pollutants into navigable waters by 1985.

b. Pollution of Ground Water

Greater uncertainty exists as to potential impacts on ground water quality. There are several aquifers within the Green River Formation which contain water of varying degrees of purity. The removal of the aquitards separating these aquifers as a result of mining activity could deteriorate the quality of some aquifers and improve the quality of others. Without a better understanding of ground water movement within the Basin, it is also difficult to determine whether the subsurface pollution caused by in-site retorting will be confined to the immediate vicinity of each chimney or spread to other areas of the Basin.

c. Impacts Resulting from the Consumption of Water

i. Salinity

Concentrations of total dissolved solids, commonly referred to as "salinity" are among the most serious water quality problems in the Colorado River Basin. The historic use of water for various purposes including industrial development, irrigation, residential use, storage, power generation, diversions to the eastern slope and the like has reduced the quantity of purer water contributed by upstream water sources and tributaries. The consumptive use of water for any purpose in the upper reaches of the Basin tends to increase downstream total dissolved solids concentrations because of corresponding reductions in the diluting effect of the contribution of such water. As a result the use of water by the industry may produce slight increases in downstream salinity. The Department of the Interior has estimated that 1970 TDS levels of the Hoover Dam would only be raised by 10 to 15 milligrams per liter, or approximately 2%, by a one-million-barrel per day industry.

ii. Availability of Water

Any large scale consumptive use of water must also be considered as a potentially serious impact in itself because of the limited availability of water throughout the Basin. The issue of whether sufficient supplies exist for all potential industrial, commercial, residential and agricultural uses planned for the Basin is subject to intense controversy. There does exist a respectable body of opinion that there is a sufficient volume of water potentially available to support at least a one-million-barrel per day oil shale industry. These supplies consist of both existing water rights owned by companies who hold interests in private reserves and anticipated volumes available for release from existing and proposed federal water storage projects.

An additional, less certain, source of water consists of the aquifers which lie within and beneath the richest zones of shale. Further studies will be required before the significance of these ground water sources can be determined. In addition, although the relationships are not precisely understood, it is generally believed that the volume of surface water flow is directly related to the quantities of available ground water. If such a relationship exists, the large-scale depletion of subsurface aquifers could seriously affect local flows of wells, springs and streams, together with corresponding side effects upon local wildlife and vegetation.

iii. Conversion of Water Rights

The satisfaction of the water requirements of a full scale industry could produce an additional regional impact. Inevitably, the consumptive demand of the industry and related off-site development could require the conversion of rights currently held for agricultural purposes to industrial and municipal purposes. These shifts in use would be consistent with the changing socio-economic character of the region. Whether such conversions would be inherently beneficial or detrimental, however, is tied to more complex philosophical questions about the desirability of industrial development beyond the scope of this presentation.

3. Geology

Moderate local impacts upon land forms and topography will result from the construction of above ground retorting facilities, the conduct of mining activities, and processed shale disposal operations. Using the proposed Colony complex as an example, a total of 200 acres will be modified by the construction of the retorting and hydrotreating facilities. An additional 800 acres will be required for processed shale disposal. A total of 400 million tons of processed shale and other solid wastes will be disposed of in this area during the life of the plant. As indicated previously, runoff from this area could be a source of serious water pollution. In an effort to eliminate this potential impact, Colony plans to construct a catchment dam beneath the disposal area, to recirculate the confined runoff water for use in retorting and disposal operations, and to install a drainage and diversion system at the processed shale embankment all of which are intended to reduce the erosion and water pollution potential of the pile.

The severe temporary impacts of strip mining operations upon local topography in the vicinity of the C-a Tract should be substantially mitigated through compliance with lease stipulations and federal regulations pertaining to reclamation of areas affected by surface mining operations. It is believed that, as a practical matter, future federal and state surface rehabilitation laws will require restoration of the surface to its original condition and usefulness.

The room and pillar mine operations currently planned for the Colony mine and which are under consideration for use beneath the C-b Tract will involve the extraction of large tonnages of ore at high rates and leave huge void spaces underground. Although pillar dimensions have been established to prevent roof collapse during mining operations, little is known about the long-term failure properties of oil shale. As a result, there is a potential for surface subsidence above the mining horizon. Although the risk of subsidence cannot be completely eliminated, the likelihood and extent of subsidence can be controlled through pillar design and alteration of mining method. It is expected that if subsidence does eventually occur, surface alteration would be a gradual, long-term process, without noticeable effect upon the general appearance of the landscape. The absence of residential or commercial facilities on most of the land lying above the reserves of commercial interest somewhat reduces the significance of eventual surface subsidence.

4. Land Use

The topographical characteristics and low annual precipitation of the Piceance Basin have limited the historical range of uses of the surface areas within the Basin. The predominant use of the land has been for cattle and sheep grazing, deer hunting, outdoor recreation and wildlife habitat. 72% of the land within the oil shale region is under federal ownership and has been classified for retention in public ownership and multiple use consistent with the historical uses previously mentioned. Cultivated and irrigated lands comprise only 4% of the total land surface. Except for obvious restrictions within the immediate vicinity of mining and retorting complexes, these facilities in themselves should not have a substantial impact upon the use of the land for grazing and wildlife habitat.

The operation of multiple plants could have more serious impact upon the aesthetic quality of the region and its appeal as an area available for outdoor recreation.

The lands surrounding existing population centers may experience a far more profound impact. Greater percentages of the limited amount of land under private ownership, especially in the vicinity of existing cities and towns, will have to be converted from agricultural use to accomodate residential and commercial growth expected to result from oil shale development. This conversion from rural to urban character is likely to be permanent.

5. Impacts on the Biological Environment

a. Flora

The impacts upon regional vegetation will consist primarily of the local destruction of communities as a result of the construction of plant facilities, road construction, off-site facilities, and processed shale disposal operations. The community types which will be destroyed by these activities are common throughout the Basin and the resulting losses may therefore be viewed as insignificant. Most operators will be required to revegetate disturbed areas either as a precondition to obtaining federal leases or to comply with independent federal regulations.

b. Fauna

A total of at least 10 species of animals which may be present in the Piceance Basin have been included in state and federal lists of threatened or endangered species. None of these species is confined in its distribution to the Piceance Basin. Some of these animals have not been sighted in the area for decades. The same limiting factors which have acted to reduce the distribution and density of these species in the Basin will continue to exist in the absence of an oil shale industry. It is unlikely, therefore, that the development of the industry will be solely responsible for the endangerment or extinction of any particular species. Although it is true that the growth of the industry may contribute to the local disappearance of these species, serious efforts will be made to avoid this result wherever threatened or endangered species are actually encountered.

Impacts upon species common to the area may be intense within the immediate area of plant construction and operation. Because of the ability of these species to replenish themselves in the other areas of the Basin, this impact should not regarded as seriously as the potential impacts upon threatened or endangered species.

c. Human Environment

Mr. Gilmore will deal far more specifically with the possible socio-economic impacts of energy resource development than is possible in this presentation. This type of impact may be the most significant of any of those covered in this seminar. Whereas existing state and local controls and the oil shale lease environmental stipulations will be adequate to minimize most of the impacts upon other components of the environment, direct controls upon the growth of industry or the expansion of population are foreign to our governmental system. Actual population growth will be a function of the employment force requirements of each retorting complex and related secondary industrial and commercial growth, the availability of local labor, the average household size of induced employees, and a variety of other highly variable factors. Considering the extremely limited housing supply and community facilities available to accomodate this growth in the region in which development will occur, the impacts of just a few plants will be very substantial.

It should be emphasized that the impacts of such growth will not necessarily be detrimental. If the utilization of the available reserves and related off-site development are properly planned, the transition from existing socio-economic condition to an industrially dependent economy should produce substantial benefits for western slope inhabitants.

ENVIRONMENTAL IMPACTS OF COAL GASIFICATION

* *

Presented To
REGIONAL ENERGY ENVIRONMENTAL
IMPACT STATEMENT SEMINAR

By
Kenneth L. Ancell
Panhandle Eastern Pipe line company

Denver, Colorado
March 6, 1975

ENVIRONMENTAL IMPACTS OF COAL GASIFICATION

- Introduction -

Coal gasification is an emerging technology. It is emerging after decades of stagnation caused by readily available supplies of lower cost petroleum fuels. The natural gas shortage has caused the natural gas transmission companies, who have flowing supplies of gas as their lifeblood, to dust off the technology and look seriously at using gas from coal as a supplemental supply to help offset the declining deliveries caused by dwindling reserves. Coal gasification is also being investigated as a source of low heating value fuel gas and of raw materials for the manufacture of chemicals, plastics, fertilizers, etc.

Each different application in each different area will have impacts that are unique to itself. However, many of the impacts will be common and it is on these common impacts that this paper will attempt to focus. In order to discuss the various aspects, the plant most familiar to the writer will be used to illustrate.

- Plant Description -

The plant about which we will be talking has several basic characteristics that must be kept clearly in mind when trying to generalize. These are listed below:

(1) The plant will make synthetic gas compatible with natural gas to be sold in interstate commerce.

(2) The plant will use the Lurgi Process developed and marketed by Lurgi Mineraloltechnik, GmbH, Frankfurt, W. Germany.

(3) The plant will process Wyoming coal that has high volatility, low ash, and very low sulphur.

(4) The plant is designed to operate in eastern Wyoming.

(5) The plant will minimize water use.

A simplified process flow diagram, Figure 1, shows the major component parts of the proposed plant.

The raw materials utilized, illustrated by input arrows marked (1) in Figure 1, are quite simple: coal, water and air. These are processed by the reactions shown in Table 1.

Table 1

Gasification Reactions

1. Coal + Heat $\rightarrow$ C+CH_4+ Other hydrocarbons (carbonization)
2. C + H_2O + Heat $\rightarrow$ H_2 + CO (water gas reaction)
3. C + $2H_2$ $\rightarrow$ CH_4 (methane synthesis)
4. C + O_2 $\rightarrow$ CO_2 (combustion)
5. CO + H_2O $\rightarrow$ CO_2 + H_2 (shift)
6 CO + $3H_2$ $\xrightarrow{catalyst}$ CH_4 + H_2O (Methanation)

The primary process stream is shown on Figure 1 by the heavy arrows. The plant is made up of the smaller units which are mentioned very briefly here. The coal handling unit receives, stores, sizes and transports the coal to the gasification area. The gasification unit is a pressure vessel operating at a pressure of about

450 psig. Reactions shown as (1) through (4) of Table 1 take place in this vessel. The shift conversion unit adjusts the ratio of carbon monoxide to hydrogen by reaction (5) of Table 1. A portion of the gas is bypassed, maintaining the proper proportions. The gas cooling unit cools the crude gas and condenses the heavier hydrocarbons. The gas purification unit extracts the sulphur compounds and most of the carbon dioxide. The methanation unit reacts the carbon monoxide and hydrogen to methane by reaction (6) of Table 1. The final gas purification unit extracts excess carbon dioxide. The product gas compression and dehydration unit extracts water vapor and compresses the product gas into the product pipeline.

The primary utilities include the oxygen unit and the power and steam generation unit. The oxygen unit supplies the nearly pure oxygen to the gasification unit. The power and steam generation unit will burn coal unusable in gasification and will supply process and utility steam to the gasification unit and the rest of the plant. The steam generated in the methanation reaction is superheated for process and utility use in the superheater unit.

Further processing of the carbon dioxide and sulphur compounds (primarily hydrogen sulphide) from the gas purification unit is done in the sulphur recovery unit, which oxidizes hydrogen sulphide to elemental sulphur. The residue gas is incinerated to convert residual sulphur compounds to sulphur dioxide and residual hydrocarbons to carbon dioxide.

The liquid stream that is condensed in the gas cooling unit is separated into hydrocarbon and water fractions in the gas liquor separation unit. The hydrocarbons are further separated into tars and oils and these are stored for sale as by-products. The water fraction is further extracted for phenols and ammonia in the phenol extraction unit. The ammonia and phenols are also stored prior to sale.

The water treating area is made up of several units that treat raw water, prepare boiler feed water, clean waste water streams and feed a sizeable cooling tower.

On Figure 1 the raw materials are marked with (1), the products are marked with (2), air emissions are marked with (3) and solid wastes are marked with (4). The plant is designed for zero liquid effluent, so there are no liquid discharges. A typical material balance for a gasification plant designed to produce 270 million standard cubic feet of pipeline gas per day is shown in Table 2.

- IMPACTS -

The impact matrix shown as Figure 2 depicts, in a summary manner, a good overview of the impacts caused by the actions related to a coal gasification plant. Each environmental component has been considered and the plant impacts are summarized by each action. The impacts are further classified by degree and length of duration. The impacts that are classified as moderate or major will be discussed in more detail.

Physiography and Land Use

The actual land used by a single plant is expected to be about one quarter section. Depending on a plant's individual location, different amounts of additional space are required for railroad sidings, access roads, water supply and coal storage. Because of an economic advantage of locating a plant close to a mine, most such plants will be located in agricultural areas where the industrial use will have a negligible impact on the land use patterns. The site itself, of course, will be leveled and the plant will be readily visible.

Solid wastes from coal gasification consist of ash from the gasification unit, and the power and steam generation unit. In addition, the water treating section of the plant produces both organic and inorganic sludges. Representative amounts of these are shown in Table 2. All these solids are handled in a slurry system, dewatered, and disposed in the surface mine. The water is recycled.

Air Quality

A summary of the atmospheric emissions that contain pollutants are shown in Table 3. These streams emit quantities of sulphur dioxide, particulates, nitrogen oxides and trace quantities of hydrocarbons.

Inherent in the plant design is the ability to contain most of the pollutants at high pressure such that they can be readily treated. Initial design did not include flue gas desulphurization on the boiler flue gas. The design resulted in 81% sulphur removal. Since our initial design and applications for permits, new sulphur dioxide emission regulations have caused us to investigate incorporating stack gas scrubbing into the design. If current regulations can be met, the plant will emit into the atmosphere only about 8% of the sulphur entering with the coal.

Conservative estimates of atmospheric dispersion show that even without stack gas scrubbing the plant will easily meet all ambient air quality regulations including the new EPA regulations for the prevention of significant deterioration of air quality for Class II areas. This fact makes us question the need for stringent SO_2 emission regulations.

Water Quality

This environmental component is mentioned because for the plant under discussion water discharge impacts have been virtually eliminated by designing the plant for minimum water use, which is also zero aqueous discharge. This is a very costly impact mitigating measure, and in another location may not be a feasible alternative. For other plants, each location will dictate the feasibility and cost-benefit relationships that must be considered to achieve zero aqueous discharge.

Social and Economic Conditions

It is on these components that coal gasification will have a major effect. This effect is caused by the creation of 2,000 to 3,000 construction jobs and about 800 permanent jobs. The problems are further compounded by the fact that all currently announced projects are located in sparsely populated areas, making it extremely difficult for existing infrastructures to absorb the new population. Depending on multipliers used, 800 basic jobs could create a permanent population increase of 6,400.

It is on these impacts that the sponsoring companies lose some of the control. Industry can control atmospheric emissions, meet zero aqueous discharge limits, and reclaim disturbed land, but the necessary expansion that must take place in the local community including expanded public facilities, water and sewer systems, new schools, health services, etc. are under the control and jurisdiction of the municipality, as they should be.

In these areas there are two basic problems. One is that the tax revenues from industrial facilities frequently do not flow to the proper governmental entity. Second, the normal tax structure is such that the tax revenues do not begin to flow until the facility is operating. In order to mitigate the social and economic impacts, these two problems need to be solved. However, responsible legislative action will be required to establish the framework to properly begin the solution to these problems in the areas affected.

Just as these impacts on the social and economic conditions are of primary concern to the local community affected, they are also a very significant and important consideration on the part of industry. The conditions that exist in the local community affect substantially industry's ability to successfully attract and retain a highly competent and stable work force. Indeed, these factors are key to the overall success of the total industrial project. Therefore, industry and the local community must work together as a team in planning the most effective methods for expanding and developing the community to meet the needs of all the citizens.

Resource Use

The objective of coal gasification for the production of synthetic pipeline gas is to use a plentiful resource (coal) and produce a clean burning, efficient fuel that can be transported in existing systems, and used in existing equipment by consumers. From a conservation standpoint, we are interested in how efficiently we can perform the operation. Table 4 shows the overall energy balance for a coal gasification plant. Calculation from Table 4 shows that the gasification process alone is about 77% efficient. In other words, 77% of the coal heating value fed to the gasification unit is recovered in usable products. However, when the boiler fuel is added to the input, the overall efficiency is about 64%.

This is an exceptionally efficient conversion process. Also of importance is the use of the other primary resource -- water. Table 5 shows a realistic balance of water requirements for a gasification plant. This balance represents efforts to minimize water usage. It is of particular importance to note that nearly one-fourth of the water requirements of the plant are supplied from moisture in the coal. This ability to contain the products of gasification, condense the vapors, and treat the effluent streams makes an important contribution toward conservation of resources in an area of scarce water.

- Summary -

Coal gasification can be used to provide a much needed energy product. Further, this can be accomplished with a minimum of environmental damage, by efficient use of a depletable resource, and with an effective use of water.

* * * * * *

TABLE 2

SUMMARY MATERIAL BALANCE FOR OVERALL GASIFICATION PLANT

Material	Quantity, short tons/day	Percent of total
Inputs		
Coal to gasifiers	22,730	18.3
Coal to boilers	4,462	3.6
Coal to sales	5,278	4.3
Water	19,860	16.0
Air to oxygen plant	23,223	18.7
Air to boilers, incinerators and steam superheater	44,891	36.0
Air in with exhaust blowers	1,000	0.8
Air to sulfur recovery unit	1,120	0.9
Chemicals	55	–
Imbalance	1,698	1.4
Total	124,317	100.0
Outputs		
SPG losses	29	–
SPG product gas	5,744	4.6
Coal fines to sales	5,278	4.3
Sulfur	62	–
Ammonia	101	0.1
Phenols	115	0.1
Tar, oil and naphtha	808	0.7
Boiler stack gases	37,932	30.5
Incinerator and superheater off gases	33,053	26.6
Final CO_2 removal off gases	2,382	1.9
Boiler ash	249	0.2
Gasifier ash	1,409	1.1
Sludges	194	0.2
Waste nitrogen	17,679	14.2
Water losses to atmosphere	16,074	12.9
Water losses w/solid waste	1,818	1.5
Sulfur recovery unit vent	1,390	1.1
Total	124,317	100.0

TABLE 3

SUMMARY OF MAJOR GASEOUS EMISSION CHARACTERISTICS

Emission characteristic	Coal-fired boiler flue gas(a)	Sulfur recovery incinerated tail gas(b)	Sulfur recovery vent gases	Emission stream incinerated expansion, lock & exhaust gases(b)	Emergency relief flare(c)	Superheater stack gas(b)	Residual CO_2 vent	Waste nitrogen
Composition								
CH_4 lb Mol/hr	–	–	0.1	–	–	–	21.2	–
CO_2 lb Mol/hr	15,317.0	36,602.0	627.2	1,703.0	23,673.0	1,267.8	4,219.9	–
H_2O lb Mol/hr	12,448.0	4,595.0	208.0	803.0	64,036.0	959.4	684.7	259.0
SO_2 lb Mol/hr	35.0	6.0	–	0.9	54.0	0.5	–	–
N_2 lb Mol/hr	76,854.0	20,315.0	2,515.2	2,732.0	82,862.0	7,659.2	0.2	52,917.0
O_2 lb Mol/hr	3,402.0	773.0	404.2	74.0	–	344.0	–	–
NO_x lb Mol/hr	48	15	–	1.0	85.0	1.9	–	–
Total lb Mol/hr	108,093.0	62,306.0	3,754.7	5,313.9	170,710.0	10,233.2	4,926.0	53,176.0
Particulate, lb/hr	314	–	–	–	–	–	–	–
Flow SCFM	683,700	394,000	5,300	33,600	1,080,000	64,700	31,200	336,400
Exit temperature, °F	350	350	90	350	2,800	350	130	80
Mol wt.	29.2	36.7	30.5	31.7	26.5	29.2	40.3	28.0
Density lb/CF	0.04	0.05	0.06	0.04	0.01	0.04	0.08	0.06
Exit velocity, ft/sec	90	90	90	90	300	90	150	150

(a) Based on 186 TPH coal fired and 20% excess air.

(b) Based on tar oil as fuel and 20% excess air.

(c) Based on emergency conditions only, not a continuous emission.

TABLE 4

SUMMARY ENERGY BALANCE FOR OVERALL GASIFICATION PLANT

Material	Energy, million Btu/hr	Percent of total
Inputs		
Raw coal (a)		
To gasifiers	16,000	83.6
To boilers	3,143	16.4
Total	19,143	100.0
Outputs		
SPG product	10,940	57.1
By-products[a]	1,376	7.1
Carbon in ash	166	0.9
Heat of stack and off gases	537	2.8
Cooling tower	1,038	5.4
Air cooling	4,845	25.3
Miscellaneous heat loss	241	1.4
Total	19,143	100.0

(a) Coal fines to sales are not included in the energy balance.

TABLE 5

SUMMARY OVERALL WATER BALANCE FOR GASIFICATION PLANT

Water source	gpm	Percent
Inputs		
Raw water	3230	74.0
Coal moisture	1061	24.3
Miscellaneous	76	1.7
Total	4367	100.0
Outputs		
Process consumption	1262	28.9
Losses to atmosphere		
Process area	400	9.2
Water treating area	66	1.5
Utility area	2145	49.0
Miscellaneous	191	4.4
Sub total	2802	
Contained in solid wastes		
In ash	174	4.0
In sludges	129	3.0
Sub total	303	
Total	4367	100.0

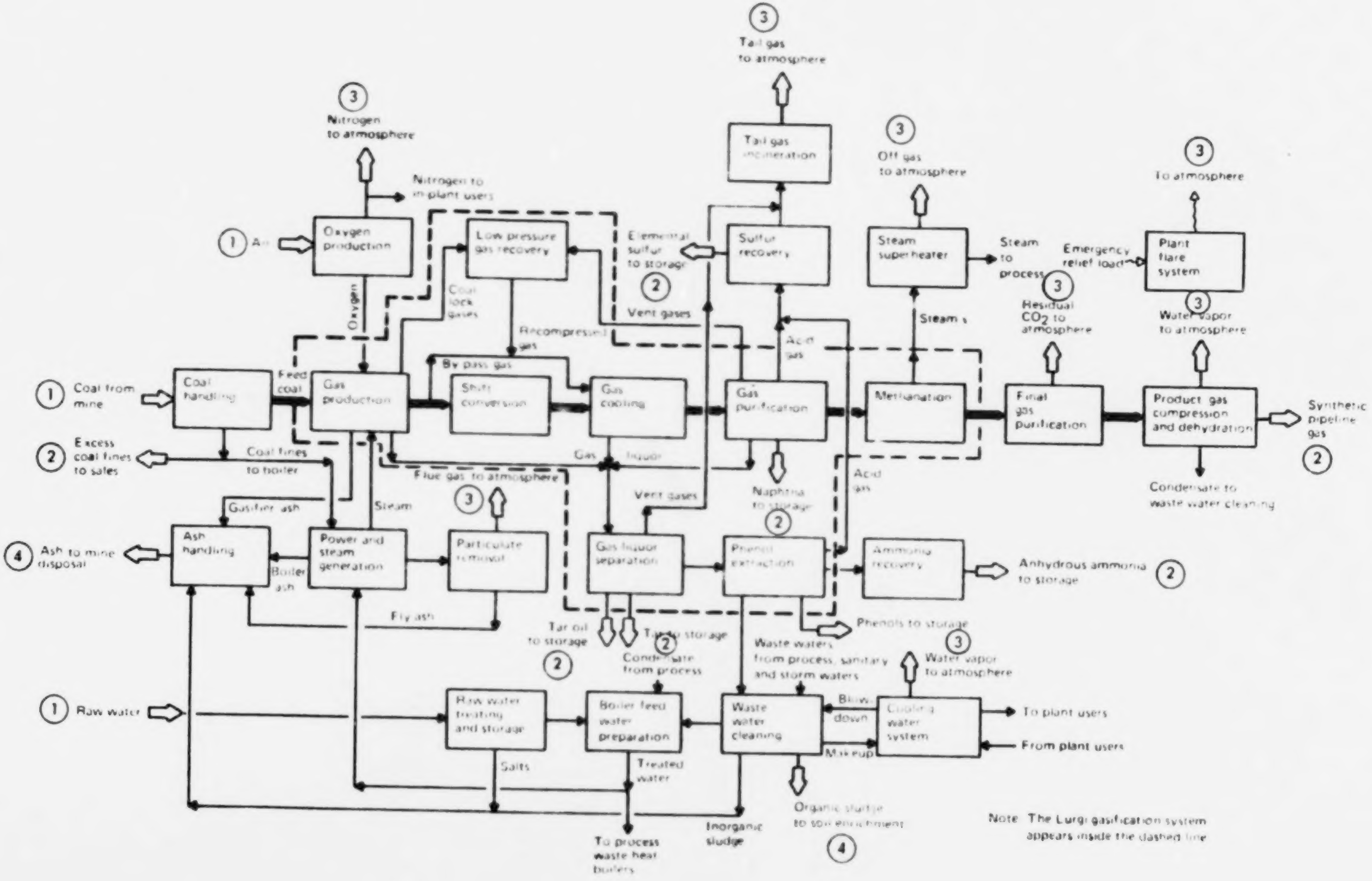

3
Nitrogen to atmosphere
Nitrogen to in-plant users
1 Air
Oxygen production
Oxygen
Low pressure gas recovery
Coal lock gases
Recompressed gas
3
Tail gas to atmosphere
Tail gas incineration
Elemental sulfur to storage
2
Sulfur recovery
Vent gases
3
Off gas to atmosphere
Steam superheater
Steam to process
Steam
3
To atmosphere
Emergency relief load
Plant flare system
3
Residual CO2 to atmosphere
3
Water vapor to atmosphere
1 Coal from mine
Coal handling
Feed coal
Gas production
By pass gas
Shift conversion
Gas cooling
Gas purification
Acid gas
Methanation
Final gas purification
Product gas compression and dehydration
Synthetic pipeline gas
2
Condensate to waste water cleaning
2 Excess coal fines to sales
Coal fines to boiler
Gas
Liquor
Flue gas to atmosphere
3
Naphtha to storage
2
Acid gas
Gasifier ash
Steam
Vent gases
4 Ash to mine disposal
Ash handling
Boiler ash
Power and steam generation
Particulate removal
Gas liquor separation
Phenol extraction
Ammonia recovery
Anhydrous ammonia to storage
2
Fly ash
Tar oil to storage
2
Tar to storage
2
Condensate from process
Phenols to storage
Waste waters from process, sanitary and storm waters
3
Water vapor to atmosphere
1 Raw water
Raw water treating and storage
Boiler feed water preparation
Waste water cleaning
Blow down
Make up
Cooling water system
To plant users
From plant users
Salts
Treated water
Organic sludge to soil enrichment
4
To process waste heat boilers
Inorganic sludge
Note The Lurgi gasification system appears inside the dashed line

Figure I Plant complex simplified process flow diagram

Action / Environmental Component	Plant Related Actions			
	Preoperation and Facilities Construction	**Plant Operations**	**By product and Waste Disposal**	**Vehicular Transportation and Roads**
Physiography	**Moderate** 334 acres disrupted, with 167 to be revegetated **Temporary Short Term**	**Moderate** 167 acres occupied by plant facilities **Short Term**	**Negligible**	**Minor** Surface occupied by roads **Short Term**
Geology	**Negligible**	**Negligible**	**Negligible**	**Negligible**
Surface Water Quality & Hydrology	**Moderate** Local siltation and erosion **Temporary**	**Negligible**	**Negligible**	**Negligible**
Ground water Quality & Hydrology	**Negligible**	**Negligible**	**Negligible**	**Negligible**
Climate	**Minor** Local increase in surface air temp., convection currents and water humidity fluctuations **Temporary Short Term**	**Minor** Local increase in surface air temp., convection currents and water humidity fluctuations **Short Term**	**Negligible**	**Negligible**
Air Quality	**Minor** Increased fugitive dust, hydrocarbons and other emissions **Temporary**	**Moderate** Increased emissions from process & fuel burning facilities **Short Term**	**Minor** Ash and bulk handling emissions **Short Term**	**Minor** Increased fugitive dust & [illegible] emissions **Short Term**
Terrestrial Ecosystems	**Moderate** 334 acres disrupted 167 to be revegetated **Temporary S T**	**Minor** 167 acres occupied by plant facilities. Salt fallout **Short Long Term**	**Negligible**	**Minor** Road kills **Short Term**
Aquatic Ecosystems	**Moderate** Local siltation & erosion **Temporary**	**Minor** Local containment & recycling of surface water. Possible TDS increase **Short Term**	**Negligible**	**Negligible**
Economic Conditions	**Major** $500 MM capital investment $159 MM payroll total $ 55 MM for local purchases $ 5.4 MM sales tax on plant equip **Temporary**	**Major** $12 MM payroll. $5 MM ad valorem tax. $450 M purchases yr. in local area. $500 M sales tax yr. **Long Term**	**Negligible**	**Moderate** Increased tax [illegible] from gas tax & fees. Increase [illegible] sector **Long Term**
Demography	**Major** 1650 average emp. over 57 mo. 2100 peak emp. Secondary population increase in serv. sector. 800 school enrollment **Temporary**	**Major** 800 perm. and 125 pt time employees. 7410 population increase. 2000 school enrollment increase **Short Long Term**	**Negligible**	**Moderate** Expected [illegible] of traffic [illegible] increase [illegible] 1980 traffic **Short Long Term**
Resource Use	**Minor** Agricultural land converted to industrial use. Commitment of capital goods to coal gasification **Short Term**	**Moderate** 11MM tons of coal used/yr. 6500 acre ft. of water required/yr. 167 acres occupied by plant facilities **Short Long Term**	**Minor** Saleable by products **Short Term**	**Negligible**
Social Conditions	**Moderate** Const. camp with facilities. Rapid increased demand in retail goods sector **Temporary**	**Major** Possible new town. 3040 [illegible] unit. [illegible] increases [illegible] rate & cost services. Life style change **Short-Long Term**	**Negligible**	**Minor** Increased expense for road maintenance and traffic control. Increased traffic & accidents **Short Term**
Aesthetics & Human Interests	**Moderate** Human activities and alteration to local landscape. Possible archaeological finds **Short-Long Term**	**Minor** Visual impact of plant from Highway 59 at S. site. Visual impact of cooling tower plume **Short Term**	**Negligible**	**Negligible**

Magnitude

Negligible	**At lower levels of detection**
Minor :	**Detectable but slight**
Moderate :	**Readily apparent and somewhat significant**
Major	**Significant**

Duration

Temporary	**0 5 years**
Short Term	**25 years project life**
Long Term	**Over 25 years**

Figure 2 Impact summary matrix

Reproduced from best available copy.

Impacts Resulting From Nuclear and Conventional Power Plants

Robert L. Pearson, Ph.D.
Public Service Company of Colorado

The construction and operation of any new nuclear or fossil fueled power plant will result in changes in the social and physical environment of the area around the plant. These changes are termed impacts and may be either beneficial or adverse depending on the circumstances of the development. The purpose of this paper is to list some of these changes or impacts which should be anticipated from a power plant development along with methods which can be used to increase beneficial impacts or reduce adverse impacts. No attempt will be made in this paper to list the reverse situation of impacts of the environment on the power plant even though both situations must be carefully evaluated in planning a plant development.

The term "power plant" can have many different meanings depending on the context of its use. In this paper, the term "power plant" will refer to a steam electric generating plant using either nuclear or fossil fuel with associated transmission and railroad facilities. Generally, nuclear and fossil plants will have similar effects for most types of impacts. For others, each type of plant will have different effects and therefore the type of fuel will be distinguished.

Several different methods are employed for grouping impacts. Some more useful methods classify impacts by: short verses long term, social verses physical, positive verses negative, critical verses non critical, severe verses moderate and low, construction phase of development verses operation phase and onsite or local verses offsite or regional. The method used in this paper is the last one of onsite verses offsite, although any other method would have been equally suitable.

Onsite impacts are those which are directly related to the electric generation plant itself because of being on or near the plant site proper. Offsite impacts are those which are indirectly related to the plant site, are affected by service corridors to the site (railroad, transmission lines, water lines) etc., or are caused by materials handling for the plant (fuel extraction, waste disposal etc.). The balance of this paper will be devoted to a discussion of onsite and offsite impacts and methods used to mitigate their effects caused by power plant development.

Onsite impacts caused by a power plant generally relate to two general resource types of biophysical resources and sociocultural resources. Each of these resource types, in turn, can be further subdivided into specific factors which are analyzed separately for critical effects and jointly for composite or interactive effects or impacts.

Biophysical resources are physical and biological attributes of an area which together completely describe the non human characteristics of a particular location. These characteristics include factors of geology, soils, hydrology, atmosphere and ecology. These factors are, in turn, subdivided into specific topics for detailed study.

Onsite impacts to geology and soils are generally related to the structural geology of the site and the surrounding area. This takes into consideration exposed and near surface geologic formations and potentially active faults in these formations. Seismic activity may be induced by the plant through disposal of waste materials in underground disposal wells although this is rarely done in modern power plants. Impacts to the geological formations themselves is limited to excavations and compaction of surface weathered material to form a stable surface upon which to build a suitable foundation. Soils on the plant site may be chemical or physically altered by construction activities or by the placement of various storage facilities such as water storage reservoirs, waste disposal ponds, coal piles, etc. Generally, these chemical alterations to the soil are irreversable but are confined to the immediate vicinity of the disturbance and may be reduced or prevented through the use of impervious linings on top of the soil layer.

Impacts to the atmosphere include alteration of the chemical quality of the air due to the emission of various materials from the plant. Fossil fueled power plants, especially those burning coal, have a problem in this area due to the large volume of combustion products which are released to the atmosphere. The very nature of fossil fuel combustion requires that emissions be made to the atmosphere from the plant although the emissions of the offensive pollutants are reduced through the use of the stack gas cleanup equipment and combustion control. Nuclear plants do not emit combustible materials to the atmosphere from the reactor, and therefore do not impact on the air quality. Cooling towers used in both fossil and nuclear plants may cause impacts to the atmosphere by introducing large quantities of water vapor which may cause local fogging and icing during cold winter weather. The ground level impacts of all of these types of emissions is reduced by locating the plant in an area which has a high atmospheric dispersion potential which causes the emissions to disperse before they reach the ground.

Impacts to the hydrology of an area include the consumptive use of water, a major consideration in the western U.S. Modern plant design may allow a lower consumptive use of water, but only at the expense of higher capital investment and slightly lower energy conversion efficiency in the plant. Other potential hydrologic impacts include discharge from the plant of water which contains dissolved and suspended solids or which is at a temperature much different from the receiving water body. As with gaseous emissions, these discharges are reduced through the use of appropriate water treatment equipment. Groundwater hydrology may be affected if the plant uses groundwater as a water source. Also the quality of the groundwater may be affected if leaching of chemicals occurs from the surface. This is prevented with the use of impervious lining of disposal ponds and material stock piles.

The construction of a new power plant will cause impacts to the local ecology through the removal of terrestrial vegetation and the dislocation or destruction of the annual life on the site. The severity of these impacts is very much dependent on the scarcity of similar land in the surrounding area. If the disturbed land is of a type that is not widely distributed in the area, then the ecological impacts will be more critical than if the plant site is situated on a land type which is common to the area.

Another important consideration of ecological impact is whether or not the plant site is located on land which holds special significance to important animal species. Some examples would be whether or not the plant site is located in areas containing rare or endangered animal species or whether the plant is located on migration routes or breeding grounds of important animal species. Typically, these areas are avoided when siting a plant.

Onsite sociocultural resources are social and cultural attributes which describe the human related characteristics of an area. These characteristics include factors of land use, economics, esthetics and human interest. These factors are similarly subdivided into specific topics for detailed study.

Impacts to land use are generally related to compatability of a power plant with existing and planned use of the surrounding land. The location of a power plant in an area, which would be severely disrupted either in land value or in present or projected use, would cause a severe land use impact. An example would be the location of a power plant in a residential area. Clearly, this is avoided or at least given very serious consideration when a plant site is initially selected. Transmission line corridors likewise are located and designed to minimize the disturbance of the surrounding property.

Impacts to the economy of an area can be both beneficial and adverse. Beneficial effects of a development will be the raising of the assessed property valuation of an area thus increasing the property tax collected. Adverse impacts on the local economy may result during the construction of a facility when construction workers increase the demand for governmental services beyond the ability of the community to temporarily provide these services. These problems may be alleviated to some degree by scheduling construction to reduce the peak number of workers on the job during the height of erection activity. The problems may also be reduced through an arrangement between the power plant owner and the affected local governments to prepay property taxes on the plant with the money being used to expand necessary government services at the time they are needed.

Impacts to esthetics can be caused either by the plant proper or by the transmission lines from the plant. The location of a power plant in an area of high scenic value can create a severe esthetic impact if the plant does not have a compatible architectural design or some sort of landscape screening. Similarly, the onsite esthetic impact of the transmission lines is considered in the design and location of the line route, where it enters the plant site.

Human interest factors which can be impacted by a power plant include location in historical areas, significant archaeological sites and unique natural resource areas such as National and State parks, wilderness areas and wildlife refuge areas. These types of areas are generally avoided in locating either power plants themselves or transmission lines from the plants.

Offsite impacts can be categorized in much the same manner as onsite impacts. The emphasis of determining degree of impact, however, is different than for onsite impact. For instance, the offsite impact of a plant on air quality is smaller at a distance from the plant than in the vicinity of the plant. Alternately, the esthetic impact of a transmission line may be greater where the line passes a scenic area far from the plant rather than close to the plant site itself. Similar comparisons can be made between offsite and onsite impacts for each of the specific topic areas described above.

A discussion of environmental impact of power plants would be incomplete without mentioning methods by which the individual topical impacts can be combined into an overall impact evaluation. Each of the individual topics must be analyzed separately to determine any which are critical and by themselves cause major concern. If no critical impacts are found for a particular location or power plant, then all of the impacts should be combined to arrive at an overall composite value.

Several methods have been used for evaluating these composite impacts. Unfortunately, each method tends to be subjective or very dependent on the personal judgment of the investigators. Therefore, a great deal of interpretation must be used to properly evaluate the results of the compositing.

The most popular methods of compositing is quantifying and weighting each of the individual topics and summing them together to form a total which is representative of the overall impact. A major drawback to this method is the determination of the validity of the numbers used as weighting coefficients and assigning proper numbers for intensity of impact. Another popular method, which is used to evaluate interactive effects, is the recording of the individual impact values in matrix form without attempting to arrive at a single value representative of overall effect. The major drawback to this method is that it does not readily allow for comparisons between power plants or locations due to the need to simultaneously analyze large arrays of numbers in matrix form. Other methods using only qualitative descriptions have been used, but these are also very subjective in nature and are thus difficult to properly interpret by outside reviewers.

The process of rating the impact to the environment from new power plants has now become a standard practice during the planning stage of a new development. If the process is performed properly, the impact analysis is used as a planning tool before decisions are made, so that the consequences of environmental impact are given serious consideration in the construction planning of a new power plant development.

ENVIRONMENTAL
DEFENSE
FUND

1130 CAPITOL LIFE CENTER
16th AT GRANT ST., DENVER, COLORADO 80203/303 623-81

WATER/ENERGY IN THE WEST

BY

KATHERINE FLETCHER

(Presented March 6, 1975 at the Regional Energy Environmental Impact Statement Seminar sponsored by the Denver Federal Executive Board, Denver, Colorado)

Water is frequently referred to as the "critical limiting factor" for development of the coal and oil shale resources in the Rocky Mountain and Northern Plains states. I would like to begin by qualifying that statement to say: "It all depends." Briefly, the extent to which the water resources of the region are adversely impacted by energy development depends:

1. On the level of energy development; and
2. On the type of energy development.

Indeed, the extent to which our water resources are impacted by energy development is going to be a function of the degree to which the most damaging aspects of energy development are either avoided or embraced in the region. With respect to coal development for example, the degree to which conversion facilities (gasification and electrical generation) and slurry pipelines are built, and strip mining in hydrologically important areas occurs will determine energy/water conflicts. On the other hand, policies which require export of coal rather than surface and ground water will be adversely affected, would prevent the majority of the potential conflicts over water for energy.

Although I do believe that water is a critically important consideration when examining energy development in the West, it cannot be considered in isolation. I do not therefore believe that sufficiency of water for a particular project is the factor which should guarantee that a proposal goes ahead, though insufficiency of water obviously would be cause for cancelling plans.

With those prefatory remarks, I will now proceed to discuss water for energy, though I hope in the proper context.

There has been much talk as to whether there is "enough" water for energy development in this region. As I have said, it all depends. How much is "enough" development? How much additional storage is "too much"? How much water transferred to energy uses from agriculture is "enough" or "too much"? How much "sharing of shortages" in drought years is "enough"? And so on.

I will not answer these questions for now, but rather will go on to some factual material which each of us--with our various philosophical differences--can interpret as we wish.

In examining the potential conflicts over water between energy companies and others, one must first make one's own determination as to how much resource speculation is taking place on the part of the energy companies, and how much real planning. We are all aware, for instance, that the energy companies are engaging in a good deal of speculation both in water and in coal in the Northern Plains, and it is indeed impossible to sort out probability from possibility. Nevertheless, a look at the possibilities--the broader scope--is essential, I think.

Putting aside the energy companies' water acquisition activities of all types except one--negotiations and contracting with the Bureau of Reclamation--one is overwhelmed by the efforts of the industry to tie up enormous quantities of water. The Bureau of Reclamation has sold on an option basis 658,000 acre-feet of water per year from two reservoirs on the Bighorn River, major tributary to the Yellowstone. In addition, the Bureau has on file pending applications for 3,083,000 acre-feet per year of water in the Upper Missouri River Basin, more than half of which is from the Yellowstone Basin--all for energy company use.

Taking the Yellowstone River, one quickly sees the potential impact of using consumptively this much water for energy development: The average annual flow of the Yellowstone River is 8,800,000 acre-feet (one must remember, however, that droughts are a fact of life in this area). Existing irrigation use of the Yellowstone River accounts for 1,171,700 acre-feet per year. Evaporation and other uses account for 140,000 acre-feet per year. The Bureau of Reclamation has conservatively estimated future irrigation water needs to be 540,000 acre-feet per year. Option contracts for industrial water from the Bureau of Reclamation account for the aforementioned 658,000 acre-feet, plus an additional 50,000 acre-feet for an unexecuted contract with Mobil Oil Company. Pending industrial water applications with the Bureau of Reclamation for Yellowstone River water account for another 1,751,000 acre-feet per year.

Now, before you add up those numbers on your pocket calculators, please remember that the Montana Fish and Game Department recommends a minimum streamflow of 7,100,000 acre-feet in an average year. As you can see, then, even in a good or average year, industrial water use in the Yellowstone Basin--considering only water supplied by the Bureau of Reclamation--presents significant conflicts. Incidentally, the total active storage capacity of all major reservoirs in the Yellowstone Basin is 2,158,000 acre-feet.

If I had more time, I would describe in detail a current legal challenge brought by the Environmental Defense Fund of the Reclamation Bureau's Industrial Water Marketing Program. Suffice it to say that we feel the marketing of impounded Bighorn River water for industrial purposes was unauthorized, and further, that if the existing water option contracts are exercised, significant adverse impacts will be suffered by water users downstream of the points of diversion.

I should also mention that the Bureau of Reclamation has not prepared any environmental impact statements for these industrial water contracts, nor for the Industrial Water Marketing Program as a whole. Violation of NEPA is also a count in our lawsuit, *EDF et al.* v. *Morton et al.*

I would now briefly like to discuss some analogous problems in the Colorado River Basin. Obviously, water problems already are critical in the Colorado Basin, even without significant increments due to development of oil shale or coal. Salinity concentrations are overly high, due in large part to consumptive use of water which would otherwise be present to dilute the salts picked up by the river from natural sources, from saline return flows and from reservoir inundation of saline land.

In absolute quantities too, there is good reason to believe that the states' water allocations under the various Colorado River Compacts exceed the amount of water actually in the river (though this does not seem to dampen each state's desire to store and use its entire "share"); water augmentation projects are deemed necessary by the Department of the Interior in order to fulfill its wish for large-scale energy development in the Basin. Ironically, out-of-basin transfers are allowed from the Colorado River, but not from the Yellowstone. Indeed, the State of Wyoming has recently obtained 120,000 acre-feet per year from Fontenelle Reservoir which it may transport to the coal fields near Gillette (which is just outside the Yellowstone Basin).

In the Colorado Basin, as in the Yellowstone, the Bureau of Reclamation has actively been facilitating energy development by making large quantities of water available to energy companies. The power plants in the Southwest, proposed coal gasification plants, numerous power plant proposals for Southern Utah, and oil shale development all depend to some extent on water supply assistance from the Bureau of Reclamation. But, largely because of the relatively more arid nature of this area, as opposed to the Northern Plains, the Bureau has been unable to promote water speculation here on the same scale. Nevertheless, the Bureau has already contracted out 266,000 acre-feet per year for energy development, and has pending applications for 208,000 acre-feet per year for energy development in the Upper Colorado Basin.

In my limited time here, I will briefly discuss the water supply situation relative to the proposed gasification facilities on Navajo land at the northwest corner of New Mexico. This situation is indicative, I think, of the water/energy problem in the Basin as a whole.

WESCO and El Paso Natural Gas Company have proposed coal gasification projects near the huge Four Corners and San Juan power plants which would create nothing less than a monumental energy complex. Together, the WESCO and El Paso projects would involve seven gasification units, synthesizing 1.75 billion cubic feet of gas per day. The WESCO project, due to a 1968 water contract between Utah International, Inc. with the Bureau of Reclamation, has secured 44,000 acre-feet per year of water from the Navajo Reservoir on the San Juan River, but El Paso's request for 28,250 acre-feet per year is pending before Congress. Because of a provision in the authorizing legislation for the Navajo Indian Irrigation Project, any other long term water contract from Navajo Reservoir must have Congressional approval, after a showing by the Secretary of Interior that sufficient water will be available through the year 2005 under New Mexico's Colorado River water entitlement.

Interestingly, there seems to be some question as to whether the Secretary's "sufficiency determination" in 1968 was accurate for the Utah International contract, let alone whether there is enough additional water for the El Paso project. Even Wayne Aspinall, Chairman of the House Interior Committee when the Utah International contract was approved, felt at the time "that the water supply situation in the Colorado River will become critical long before the date anticipated by the Secretary of Interior," though he decided not to object to the approval. A Congressional Research Service analysis of the situation has concluded that a large *deficit* is far more likely than the "sufficiency" the Secretary projected, and that good grounds exist for Congressional denial of the El Paso request, as well as for additional scrutiny of the Utah International contract.

Water, then, whether it provides *the* limiting factor on energy development, is certainly of critical importance. Perhaps the most significant consideration is the fact that energy development may easily be able to displace other water uses, especially agriculture, strictly on the basis of ability to pay. To an energy company, even a high price for water is a minor expense, both in terms of the other costs of energy production, and in terms of the profitability of the operation. In contrast, water to a farmer is a major expense, even at a low price. And, as we all know, farming--particularly family farming--is not consistently very profitable. We must then ask if the ability to pay [redacted] adequately reflects our true water use priorities. I think not.

In closing, I would like to address a few comments specifically to the subject of this meeting--environmental impact statements for energy development proposals, for in my experience, the water impacts of energy proposals are rarely treated adequately, if at all. Even in cases where the Bureau of Reclamation prepares the impact statements--as has been the case for coal development proposals in the Southwest--the impacts of water supply have not been analyzed. In addition, Interior's programmatic impact statements on oil shale leasing and on coal leasing are remarkable for their lack of consideration of this factor.

For a moment, however, I would like to take a novel position (for me, that is) and express sympathy--in one case anyway--for a federal agency which truly would like adequately to consider the impacts of a water/energy proposal: In Wyoming, the Bureau of Land Management has been asked by Carter Oil Company (Exxon) and Atlantic Richfield Company to consider their request to build a reservoir on the Middle Fork of the Powder River. Although the companies propose that 25,000 acre-feet of the proposed storage will be allocated to "industrial use," the BLM is utterly unable to obtain from the companies any specific indication of how the water would be used. What the BLM is now attempting to do is to prepare an environmental impact statement on all the possible coal development uses of 25,000 acre-feet per year of water. This, in my view, has put the federal agency in an absurd position.

People from other parts of the country may view those of us in this region as a little fanatic on the subject of water. But the threats, conflicts and questions posed be energy development justify, I think, our fanaticism. And in the case of the farmer, the rancher, the Mexicans, the fisherman, the recreationist and the much-maligned phreatophyte, I think paranoia may be justified as well!

Thank you.

Environmental Impact Assessment Project

A project of The Institute of Ecology

1717 Massachusetts Avenue, N. W., Suite 300, Washington, D. C. 20036

John S. Winder, Jr., Director
Telephone (202) 462-5700

"ECOLOGICAL CONSIDERATIONS IN THE PREPARATION OF REGIONAL ENERGY ENVIRONMENTAL IMPACT STATEMENTS"

John S. Winder, Jr.
Denver, Colorado
March 6, 1975

Dr. Marion Clawson, acting president of Resources for the Future, Inc., recently criticized the NEPA process in an article entitled "Ecology: Second Thoughts". Dr. Clawson stated:

> Environmental impact statements surely impede public action, whether it be well or ill conceived. They are costly to prepare, are an open invitation to lengthy court disputes, and may in time be largely thwarted as public agencies learn perfunctory compliance. A sharp check rein upon public agencies was almost surely necessary, but the short-run efficiency of environmental impact statements is low and their long-run effectiveness is, at best, unproven. /1

Notwithstanding such criticism, the Council on Environmental Quality concluded in its annual report for 1974 that:

> NEPA is alive and well. It has passed through a transition period, during which agencies have become aware of the act's widespread requirements, and the basic structure of the environmental impact statement process has become firmly established. /2

Although NEPA is indeed alive and well, EIS's can and should be better. For example, also in their 1974 report, CEQ suggests and predicts that:

> Looking ahead at the next few years, the clearest and most probable major advance is likely to be in the quality of environmental analysis contained in impact statements. /3

This specific need, in fact, was the primary focus of the Ford Foundation grant which, in July 1973, led to the establishment of the Environmental Impact Assessment Project -- a project of the Institute of Ecology.

The broad, primary goal of the Assessment Project is to improve the Federal planning and evaluation procedures mandated by NEPA which requires all Federal agencies to

> utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment. /4

The Assessment Project has proceeded on the basis of two principal assumptions: (1) that federal agency and public review processes under NEPA are of critical importance to the preservation and enhancement of environmental quality, and (2) that the environmental impact statement (EIS) process can be improved by the consistent use of scientific knowledge and perspective.

During the first phase of the Assessment Project, the main objective was to provide scientific and policy reviews of selected EIS's. In each case, a team of experts, recruited by the Project staff, reviewed the EIS and developed recommendations to improve the content of the EIS and the direction of the proposed project or program in an effort to minimize adverse environmental impacts.

As a result, project reviews of the following EIS's have been published: Prototype Oil Shale Leasing (FES), the Crow Ceded Area Coal Lease in Montana, the North Lake Tahoe-Truckee River Basin Wastewater and Conveyance System, the Eastern Powder River Coal Basin Coal Development in Wyoming, the Federal Coal Leasing Program, and the Garrison Diversion Project in North Dakota.

The Assessment Project is now entering its second phase, which is designed to develop substantive guidelines to be used in the preparation and review of EIS's. Drawing upon the expertise of Project Review Teams, consultants, CEQ, Agency EIS units, and others, the Project plans to design two basic sets of guidelines: (1) generalized substantive guidelines which will be applicable to all EIS's, and (2) specialized substantive guidelines for coal development EIS's and for specific water resources EIS's.

Four of the six reviews published by the Assessment Project focussed on energy resource development proposals. It is clear that these four EIS's and the respective reviews provide substantial material for the consideration of ecological factors and concepts in the preparation of regional energy environmental impact statements.

The threshhold question, of course, is what is a workable definition of the scope of a regional impact statement? It would appear, for example, that the scope of a regional statements combines many features of a programmatic EIS and many features of a project or site-specific EIS. While ecological concepts can and must be applied to all types of EIS's, the most effective application of these concepts hinges upon a relatively precise definition of the scope of the proposed action.

Of the four energy EIS's reviewed by the Assessment Project, as noted above, the Eastern Powder River EIS most likely comes closest to a regional EIS. Nonetheless, the Powder River EIS presented definitional problems to reviewers. For example, the Assessment Project review team noted:

"The approach of the statement is to present both a regional and site-specific analysis, yet, the two analytical approaches are not consistent. The statement thus fails to satisfy either regional analysis or site-specific evaluation criteria.

"Furthermore, the EIS designation of an 'Eastern Powder River Coal Basin' is misleading. The Powder River Basin is a hydrological basin and includes most of northeast Wyoming. A regional analysis of coal development based on coal resource definitions would cover a three-state area. If the immediate off-site impacts were included, the area covered would be the five states included in the Northern Great Plains Resources Program." /5

It is further noted in the Powder River review that:

"The concept of a regional analysis has not been clearly defined in the EIS and, in fact, is arbitrary and inconsistent from one section to the next for a single resource. Area or number reference (plants, mines, reservoirs, etc.) appear to change from one page to the next. This problem is aggravated by the constant shifting in measurement units, and the apparent transposition of figures and tables so that these fail to correspond with the text." /6

The Powder River regional EIS clearly posed the ecological and policy dilemma when it stated that "the extent and types of faunal effects cannot be determined at this time. The prediction would depend upon presently unavailable information, including location and size of projects." /7 The review team broadly concluded that "Clearly this information must be collected prior to the conduct of an adequate regional impact analysis." /8 However, the type and scope of this information must be defined.

Some guidance on this issue must be gleaned from considerations of the purposes of regional impact statements, similar presumably to the purposes of a programmatic EIS, as distinct from the purposes of a project statement. The Assessment Project reviewers of the Federal Coal Leasing EIS commented at some length on the definition of a programmatic EIS in part, as follows:

"There is no particular magic in the word 'programmatic'; by itself, it conveys only a limited sense of what the statement should be. A programmatic statement embraces any NEPA statement on a major federal action significantly affecting the human environment when the action involves no immediate, discrete and site-specific undertaking.

"Despite the critical need for evaluating federal coal management, the purpose of this impact statement, and its relevance to the coal leasing decision to be made is obscure even now. Theoretically, the EIS should both help the Department and the public analyze and resolve critical environmental problems and respond to the needs of the Secretary of the Interior for rational information-gathering and decision-making....

"The basic issues posed by the 1973 moratorium that were not addressed clearly in the EIS are (a) whether federal coal should be subject to further leasing and (b) if so, then when, how much and where leasing should occur and how quickly it should proceed. To answer these questions requires careful analysis of extensive baseline data and the accumulation of information on the various environmental effects of coal resource management alternatives. A programmatic environmental impact statement is superbly suited to develop these data and to bring them to the attention of the policy-maker in an accurate, readable and useful fashion. This, however, was not accomplished by the coal program EIS.

"The kind of programmatic statement that would be responsive to the legal requirements of NEPA and to the rational decision needs of the Department, would be a relatively short, but analytical, document serving more as a decision option paper than as a lengthy description of the environment and exploration of the minutiae of various coal leasing problems....

"Emphasis of the statement should be on viable alternative policies and on the cumulative environmental effects of these alternatives. These considerations were ably expressed by the Council on Environmental Quality (CEQ) in May 1972, when it described the purpose of the programmatic impact statement:

> It provides an occasion for a more exhaustive consideration of efforts and alternatives than would be practicable in a statement on an individual action. It ensures consideration of cumulative impact that might be slighted in a case-by-case analysis and it avoids duplicative reconsideration of basic policy questions. (CEQ Recommendations for Improving Agency NEPA Procedures, III Environment Reporter (BNA), Current Developments (May 1972), p. 85)

"Other potential advantages of programmatic statements are their ability to relate in general terms the results of research to resource management decisions, to explore such basic questions as how the federal government can help preserve and enhance the environment and to assess various ways available to the Department to manage public resources in the public interest. Furthermore, as some federal agencies have already recognized, a programmatic EIS is an appropriate place for a careful national cost-benefit evaluation of a particular policy." /9

In an attempt to apply this definition of the purpose of a programmatic statement to the Federal Coal programmatic EIS, the review team suggested that a new EIS on Federal Coal leasing should

> (a) consider and compare the environmental impacts of all available methods or procedures for coal leasing at several representative levels of leasing (from no leasing whatsoever to the highest level possible); (b) consider the environmental trade-offs and impacts of different approaches on a geographic basis, taking into account all significant variables such as climate, availability of water, land reclamation, transportation and social structure;... (c) consider whether and how the federal government should attempt to control how the coal will be mined... (d) relate the considerations in (a), (b) and (c) to the coal already under lease, and consider all alternatives for dealing with that coal in light of the factors seen as important in future coal development and leasing (obviously including legal constraints). Moreover, national energy questions must not be neglected in this EIS. /10

Ecological analysis is potentially useful not only for the purpose of helping define the scope of an EIS but also for the purpose of relating the impacts to that scope. As the Assessment Project reviewers of the Federal Coal EIS noted,

"Understanding the relevant ecosystems is, or should be, at the heart of any assessment of the environmental impacts of coal development. Although the EIS contains a fair amount of information concerning the flora and fauna in the coal provinces, it portrays little understanding of ecosystem function and even less analysis of the relevant impacts of federal coal development on the biota." /11

The failure to utilize ecological concepts may result in a shallow impact assessment and thereby prevent meaningful evaluation. The Oil Shale EIS included the following comments on wildlife impacts:

> In general, the native fauna of the oil shale region would react to industrial development and urbanization in the same way fauna have reacted to the pressures of expanding population and land development in other parts of the United States. Species such as mountain lions, elk, large raptors, and grouse, which, because of unique behavioral traits, are intolerant of human activity, will retreat from the area, and their numbers will be reduced by the loss of available territory. Deer herds will be reduced for the same reasons, but, being more tolerant, they will not retreat as far. Increased interference with their migratory routes will tend to favor those animals that do not migrate and alter the behavior of herds over time. Losses of native fauna can be related to the level of development and the populations of intolerant species will be reduced. More tolerant species and species which utilize smaller territories will also be reduced in numbers, mainly by the physical loss of habitat and the impact of introduced pollutants such as dust, pesticides, polluted waste water, and noxious effluents from industrial processing. /12

In response to this comment in the EIS, the review team suggested that the critical, and unanswered, questions are: "What will be the environmental effects of such wildlife destruction on the undeveloped lands near the oil shale tracts? What ecosystem changes can be forecast from changed or destroyed migration patterns or predator-prey relationships? The EIS does not tell us because it neglects to take an ecological approach to wildlife analysis." /13

A similar problem was identified by the Assessment Project review team analysis of the Crow Ceded Coal EIS when they stated:

"The 'Usefulness Code' notations following most of the plant names indicate a very narrow view of the ecological functions performed by the component species in a stable plant community. As an illustration, several species are followed only by the notation "U -- undesirable species -- weed." Farmers may not make much use of plants of the genus Artemisia (sagebrush) but these plants are important indicators of soil type and surface water conditions; they grow on land where the short-grass species cannot, providing soil retention, organic matter, and food and shelter for wildlife." /14,

The application of ecological principles to the preparation of an EIS will clearly help identify and evaluate the values of deer and sagebrush. But in addition, and equally if not more important, the effective use of ecological analysis can identify and evaluate the human environment.

The practical application of ecological concepts to an EIS requires of course a full understanding of the meaning and the limits of those concepts and, in addition, requires the critical component of baseline data. In fact, the lack of such data poses a recurring problem in many EIS's. For example, the Powder River EIS noted:

" ... this habitat disturbance will most likely have a long-term cumulative impact on fish and wildlife populations and could result in losses which cannot be presently quantified." /15

Further, the EIS stated:

> Inventories as to the exact occurrence and dependency of these species on the area to be developed and/or disturbed have not been accomplished. Therefore, precise impacts cannot be analyzed at this time ... Without adequate knowledge of ranges and habitat requirements, a reduction in range may have serious long-term consequences. /16

Again, the Prototype Oil Shale EIS commented on the lack of data related to the issue of re-vegetation:

> Grasses can usually be well established in 3 to 5 years on soils of the region. Successful establishment and enduring cover over large areas and under varying conditions is uncertain. /17

While such data gaps will always be a problem with EIS's and other types of environmental assessment, continuous and specific identification of such gaps will help to fill them. In addition, authors of EIS's must make an effort to evaluate and rank the relative potential importance of the missing information.

Lastly, it is important to apply ecological analysis to specific types of potential impacts of energy and other types of resource development. For example, impact on soils is one of the potential adverse environmental impacts of energy resource development. The Assessment Project review team commented as follows on some of the inadequacies of the Powder River EIS treatment of soil impacts:

"The EIS does not outline the geologic history of the soil units -- how old the soils are or how immature they may be. This can only be derived from first-hand knowledge of the soil association units. The surficial geologic information is not geomorphic, i.e., it does not tell the reader how that landform and its associated soil and vegetation were formed. One cannot, therefore, know how it will behave when disturbed and recontoured." /18

Similarly, the Crow Ceded review team recommended an expanded consideration of soil impacts as follows:

> Soil is not a substance that can be stored in a pile while mining goes on and then profitably spread back over the ground. Soil is a living biogeochemical substrate composed of partly weathered and stratified minerals, delicately bound mineral nutrients that are available to plants on demand (but not available to leaching rain waters) and living or dead organic substances and organisms that participate in the nutrient cycle between plant and substrate. The stratigraphic order of each two to four inch segment of the top foot or more of the soil should be preserved to facilitate reclamation to a stable community, and each must be kept viable. The EIS does not discuss this problem. It has taken at minimum ten thousand years for the soil and its inhabitants to develop in eastern Montana, and this soil today is still evolving. /19

Perhaps water resources represent the most critical of all of the potential adverse impacts of energy resource development -- and most particularly acute in the Northern Great Plains. It is this factor which may provide the most finite limit on the carrying capacity of the region and therefore, perhaps, the one factor which must receive most careful ecological analysis.

The Federal Coal leasing EIS clearly stated that:

> Water is so scarce in [the Powder River Region] that proposals to develop coal here include plans for large water diversions from outside the Powder River Basin. /20

The Powder River EIS also recognized that "the number of acres under irrigated crop production has been rising gradually over the years but is limited by water ... and demand for irrigation water exceeds the supply." /21

However, the review team criticized the Interior Department analysis of water impacts of the proposed Powder River coal development as follows:

> Although the water section of the EIS presents both figures and descriptions, it is inadequate, unclear, conflicting and, in places, not based on fact. Estimates for groundwater are probably too high. Surface water resources are not fully discussed in terms of availability, changes in use or the impacts of both in-basin and trans-basin diversions. Thus the impact for northeast Wyoming and for other areas of the State which may lose water to Powder River Basin coal development cannot be assessed. /22

The review team which assessed the Federal Coal Leasing EIS concluded, in general, that a significant portion of this and similar EIS's should focus on the following major potential impacts of large-scale water diversions for energy development: (1) loss of irrigation water; (2) damage to fish, wildlife, and vegetation; (3) increasing salinity and sediment loads; and (4) loss of recreation and aesthetic values. /23

More specifically, the Powder River review recommended comprehensive analysis of the following aspects of water impacts:

> 1) alteration of stream flow or pond/lake volume via release or use of water; 2) amount and composition of petroleum products, detergents, solvents, sewage or other compounds which may be released into waters; 3) changes expected in dissolved ions; 4) amount and type of potentially toxic elements and compounds reaching surface waters; 5) amount of suspended particulate matter reaching surface waters. /24

In conclusion, the increasing application of ecological concepts can surely help improve the environmental impact assessments contained in environmental impact statements. Moreover, in the final analysis, this approach may help answer, in the affirmative, one major, unanswered NEPA question, as recently posed by Gladwin Hill:

> whether environmental impact assessment can be made, as NEPA's authors envisioned, an integral part of Government planning rather than after-the-fact justification. /25

FOOTNOTES

1 Marion Clawson, "Ecology: Second Thoughts", *The Washington Post* (Washington, D.C.,February 28, 1975), p. A22.

2 *Environmental Quality - 1974* (The Fifth Annual Report of the Council on Environmental Qulaity) (U.S. Government Printing Office, Washington, D.C., 1974), p. 413.

3 *Ibid.*, p. 409.

4 The National Environmental Policy Act of 1969, P. L. 91-190, 42 U.S.C. 4321-4347.

5 J.S. Winder and C. Lochner (eds.), *A Scientific and Policy Review of the Draft Environmental Impact Statement on the Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming* (Environmental Impact Assessment Program/The Institute of Ecology, Washington, D.C., August 1974), p. 8.

6 *Ibid.*, p. 9.

7 *Ibid.*, p. 44.

8 *Ibid.*

9 K. Fletcher (ed.), *A Scientific and Policy Review of the Draft Environmental Impact Statement for the Proposed Federal Coal Leasing Program* (EIAP/TIE, Washington, D.C., 1974), pp. 4-6.

10 *Ibid.*, pp. 9-10.

11 *Ibid.*, p. 174.

12 *Final Environmental Impact Statement, Prototype Oil Shale Leasing Program*, (U.S. Department of the Interior, Washington, D.C., August 30, 1973), Vol. IV, p. III-54.

13 K. Fletcher and M.F. Baldwin (eds.), *A Scientific and Policy Review of the Prototype Oil Shale Leasing Program Final Environmental Impact Statement* (EIAP/TIE, Washington, D.C., October 29, 1973), p. 105.

14 R. Applegate, M.F. Baldwin (eds.), *A Scientific and Policy Review of the Draft Environmental Impact Statement: Crow Ceded Area Coal Lease Westmoreland Resources Mining Proposal* (EIAP/TIE, Washington, D.C., November 29, 1973), p. 19.

15 Op. cit. footnote 6, pp. 36-37.

16 Draft Environmental Impact Statement on the Development of Coal Resources in the Eastern Powder River Coal Basin (U.S. Department of the Interior, Washington, D.C., June 1974), p. I-529.

17 Op. cit. footnote 13, Vol. I, p. III-25.

18 Op. cit. footnote 6, p. 20.

19 Op. cit. footnote 15, pp. 22-23.

20 Draft Environmental Impact Statement for the Proposed Federal Coal Leasing Program (U.S. Department of the Interior, Washington, D.C., May 1974), p. II-148.

21 Op. cit. footnote 17, I-375, 379.

22 Op. cit. footnote 5, p. 32.

23 Op. cit. footnote 10, p. 153.

24 Op. cit. footnote 6, pp. 42-43.

25 G. Hill, "Midpoint of 'Environmental Decade': Impact of National Policy Act Assessed", The New York Times (New York, New York, February 18, 1975), p. C1.

Socio-Economic Impacts Coverage in Environmental Impact Statements (EIS's)

J.S. Gilmore
University of Denver
Research Institute
6 March 1975

The socio-economic impact sections of environmental impact statements are usually very poor. They rarely reflect the present state of the art in applied social science research, particularly the concepts and methodologies of technology assessment. They usually don't even use the oldest forecasting technique of all: analogy with a similar situation.

There are probably two groups represented in this audience with an interest in seeing the socio-economic sections brought up to a level of adequacy:

- groups which prepare EIS's
- groups which review EIS's

The group preparing an EIS wants an acceptable statement, acceptable by all of its constituencies and acceptable by the courts. Otherwise, delay may be embarrassing and costly.

Those reviewing an EIS often have a direct interest in a full statement of socio-economic changes and problems resulting from the proposed action. Their agencies may have to take an active role in mitigating negative impacts or in picking up the pieces after extreme socio-economic impacts have been felt.*

---

*In a recent three hour exercise with the U.S. Government Organization Manual, 21 Federal agencies with a direct role in mitigating impacts of accelerated oil shale development were identified. See Oil Shale Task Force Report, Project Independence Blueprint, Washington: GPO, 1974.

The first group, those preparing EIS's, face delay from two sources: 1) reviewing agencies or superior agencies, and 2) the courts. The courts have generally been concerned with compliance with the National Environmental Policy Act (NEPA), and with the good faith exhibited in attempting to comply.

If the existing capability for identifying socio-economic impacts is called to the attention of a court and then compared with a conventional, inadequate EIS job, it is hard to see how the court will find either:

- compliance with Sec. 102 (A) of NEPA, or
- good faith.

Futhermore, technology assessment methodology conventionally seeks to identify opportunities and develop programs for taking advantage of innovations, not merely suffering from induced changes. In other words, mitigation of negative impacts may at least move the impacts out of the "irreversible" category, and theoretically may turn them into benefits.

So what is technology assessment? It may be defined as: ". . . thorough and balanced analysis of all significant primary, secondary, indirect and delayed consequences or impacts, present and foreseen, of a technological innovation on society, the environment or the economy."*

Technology assessment has been developing for some time. The National Academies of Science and Engineering both issued reports on the need for it and on methods for it in 1969. There is an extensive literature, journals, etc. It is institutionalized in both the legislative and executive branches of the Federal government. There is some fairly good work being done in energy-related fields: offshore drilling, geothermal energy, hydrogen systems, coal conversion.

---

*Report of House Rules Committee, Technology Assessment Act of 1972, (setting up Congressional Office of Technology Assessment). Washington: GPC, 1972.

It's applied social science; not startlingly new, but somewhat different. It is not data-limited. It pushes you to start with identifying impacts or consequences and *then* looking for data, *not* vice verse, *not* looking to see what data are secondarily available and limiting impact identification to those areas. The Canadians are pushing farther, too. In their assessment of the MacKenzie Valley pipeline, they are looking at the consequences of construction, operation, *and* abandonement of the operation. A better approach to an EIS.

How is technology assessment done? There are several hundred articles and books, but one simple outline is the following (it was published in 1971 in a report supervised by Martin V. Jones, then of the Mitre Corporation*).

Viewgraph
1

The other neglected methodology is analogy. We do have an example of rapidly developed, multi-firm minerals development in a rural Western community. What has happened there is a fairly good check list of what happens when the *cumulative impact* of several independent developments occurs. I emphasize "cumulative impact" because that's the only thing that counts in looking at what happens to a community. Conversely, mitigating actions must address the total complex of problems, unless the total problem is a one firm development affecting a single community.

The example--the check list--I mention is Sweetwater County, Wyoming--Rock Springs and Green River.

---

*_A Technology Assessment Methodology, Volume 1_, Washington: NTIS, 1971, p. 26.

EXHIBIT 6
SEVEN MAJOR STEPS IN MAKING A TECHNOLOGY ASSESSMENT

		Discussed In Chapter
STEP 1	**DEFINE THE ASSESSMENT TASK** Discuss relevant issues and any major problems Establish scope (breadth and depth) of inquiry Develop project ground rules	**V**
STEP 2	**DESCRIBE RELEVANT TECHNOLOGIES** Describe major technology being assessed Describe other technologies supporting the major technology Describe technologies competitive to the major and supporting technologies	**VI**
STEP 3	**DEVELOP STATE-OF-SOCIETY ASSUMPTIONS** Identify and describe major nontechnological factors influencing the application of the relevant technologies	**VII**
STEP 4	**IDENTIFY IMPACT AREAS** Ascertain those societal characteristics that will be most influenced by the application of the assessed technology	**VIII**
STEP 5	**MAKE PRELIMINARY IMPACT ANALYSIS** Trace and integrate the process by which the assessed technology makes its societal influence felt	**IX**
STEP 6	**IDENTIFY POSSIBLE ACTION OPTIONS** Develop and analyze various programs for obtaining maximum public advantage from the assessed technologies	**X**
STEP 7	**COMPLETE IMPACT ANALYSIS** Analyze the degree to which each action option would alter the specific societal impacts of the assessed technology discussed in Step 5	**XI**

Viewgraph 2

The negative impacts are categorized in three classes:

- degraded quality of life
- reduced industrial productivity and profitability
- local services fall short of needs.*

These result from a failure to achieve balanced growth from a major addition to basic plan investment.**

Viewgraphs 3 & 4

Viewgraph 5

And mitigating actions may be taken to manage growth and avoid irreversible impacts.***

In summary, EIS's aren't dealing as well with socio-economic impacts as they could. It is in the interest of many of those involved to do better. Doing better, as suggested here, would appear to provide better compliance with NEPA Sec. 102 (A), Sec. 102 (B), and Sec. 102 (C)ii, among others. It would also avoid potentially embarrassing comparisons between an EIS under court reviews and the quality of impact assessment, that is becoming more common and more institutionalized throughout government.

---

*Gilmore & Duff, The Process for Policy and Objectives for Growth Management in Sweetwater County, Wyoming, a DRI report available from the Sweetwater County Priorities Board, County Court House, Green River, Wyoming.

**Ibid.

***Ibid.

NEGATIVE IMPACTS OF THE BOOM

A. DEGRADED QUALITY OF LIFE

1. HOUSING
2. HEALTH SERVICES ARE INADEQUATE
3. FRINGE DEVELOPMENT IS UNSATISFACTORY
4. RECREATION AND EDUCATIONAL FACILITIES AND SERVICES
5. COST OF LIVING
6. CRIME RATES RISE
7. WIVES

B. REDUCED INDUSTRIAL PRODUCTIVITY AND PROFITABILITY

C. THREATENED THE FISCAL VIABILITY OF LOCAL GOVERNMENT

FIGURE IV
MAJOR ADDITION OF BASIC PLANT INVESTMENT

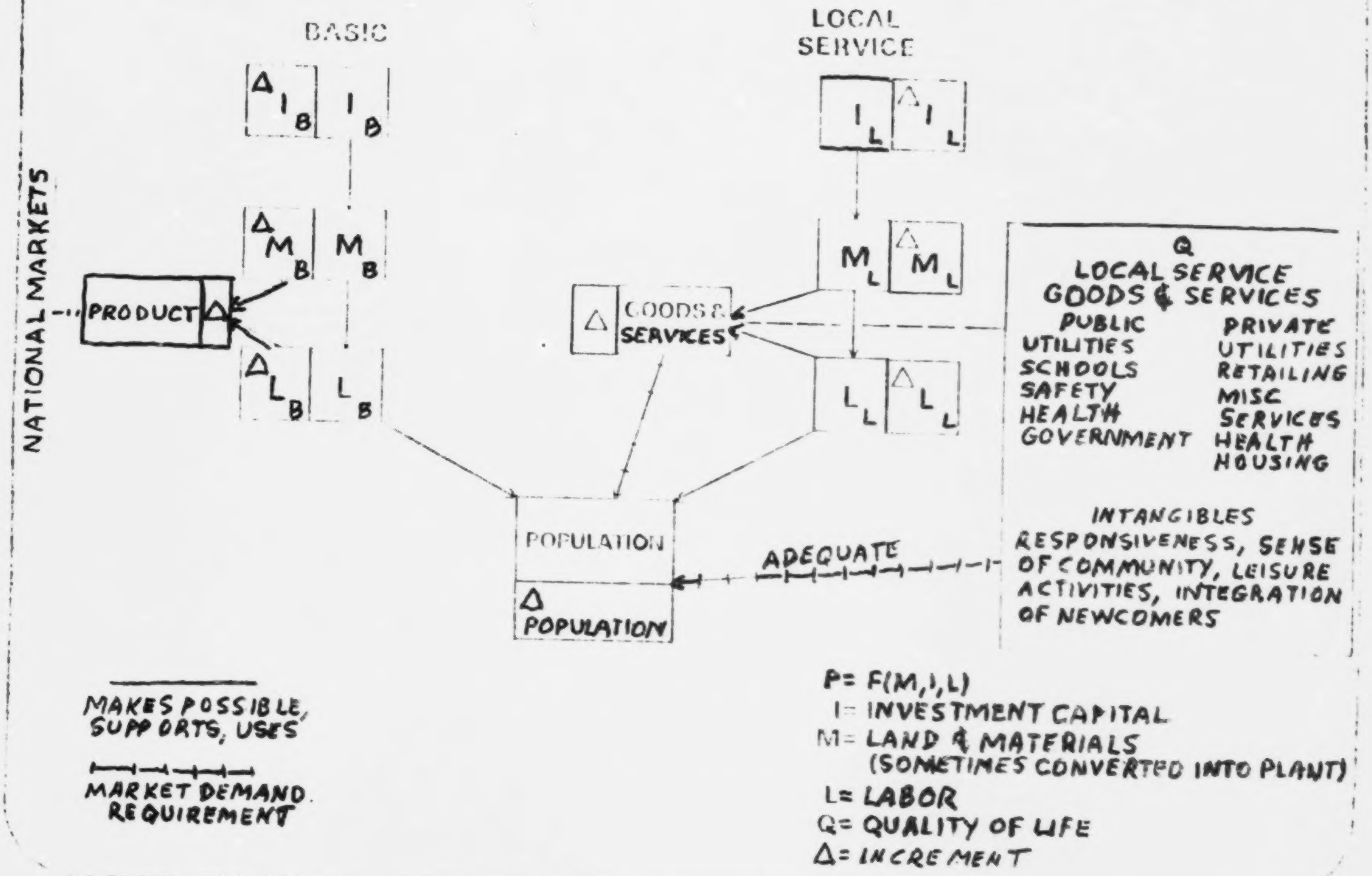

BASIC
LOCAL SERVICE
NATIONAL MARKETS
PRODUCT
Δ
ΔI_B
I_B
ΔM_B
M_B
ΔL_B
L_B
I_L
ΔI_L
M_L
ΔM_L
L_L
ΔL_L
Δ GOODS & SERVICES
POPULATION
Δ POPULATION
ADEQUATE
Q
LOCAL SERVICE GOODS & SERVICES
PUBLIC
UTILITIES
SCHOOLS
SAFETY
HEALTH
GOVERNMENT
PRIVATE
UTILITIES
RETAILING
MISC
SERVICES
HEALTH
HOUSING
INTANGIBLES
RESPONSIVENESS, SENSE OF COMMUNITY, LEISURE ACTIVITIES, INTEGRATION OF NEWCOMERS
MAKES POSSIBLE, SUPPORTS, USES
MARKET DEMAND REQUIREMENT
P= F(M,I,L)
I= INVESTMENT CAPITAL
M= LAND & MATERIALS (SOMETIMES CONVERTED INTO PLANT)
L= LABOR
Q= QUALITY OF LIFE
Δ= INCREMENT

FIGURE V
UNBALANCED GROWTH

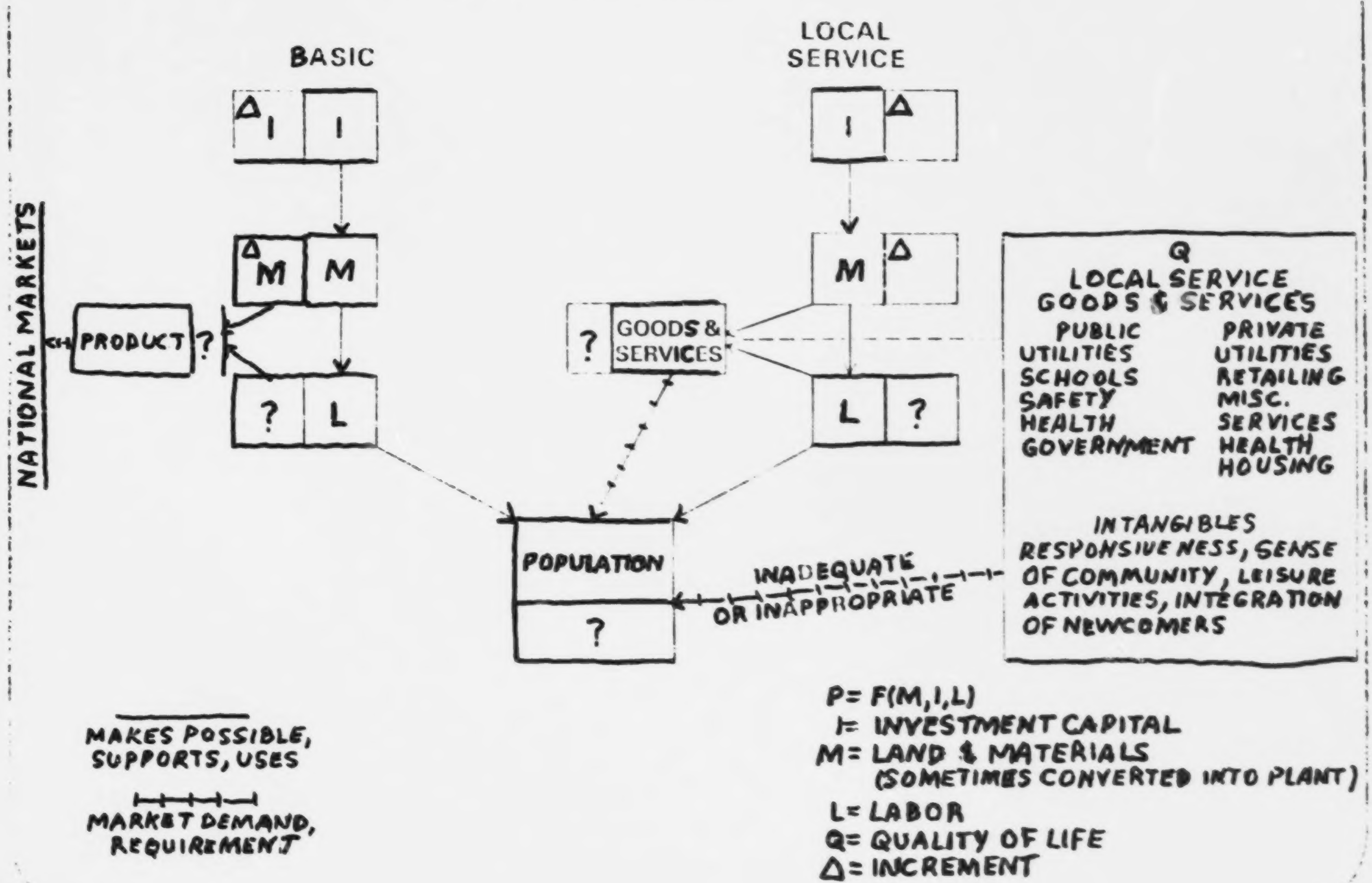
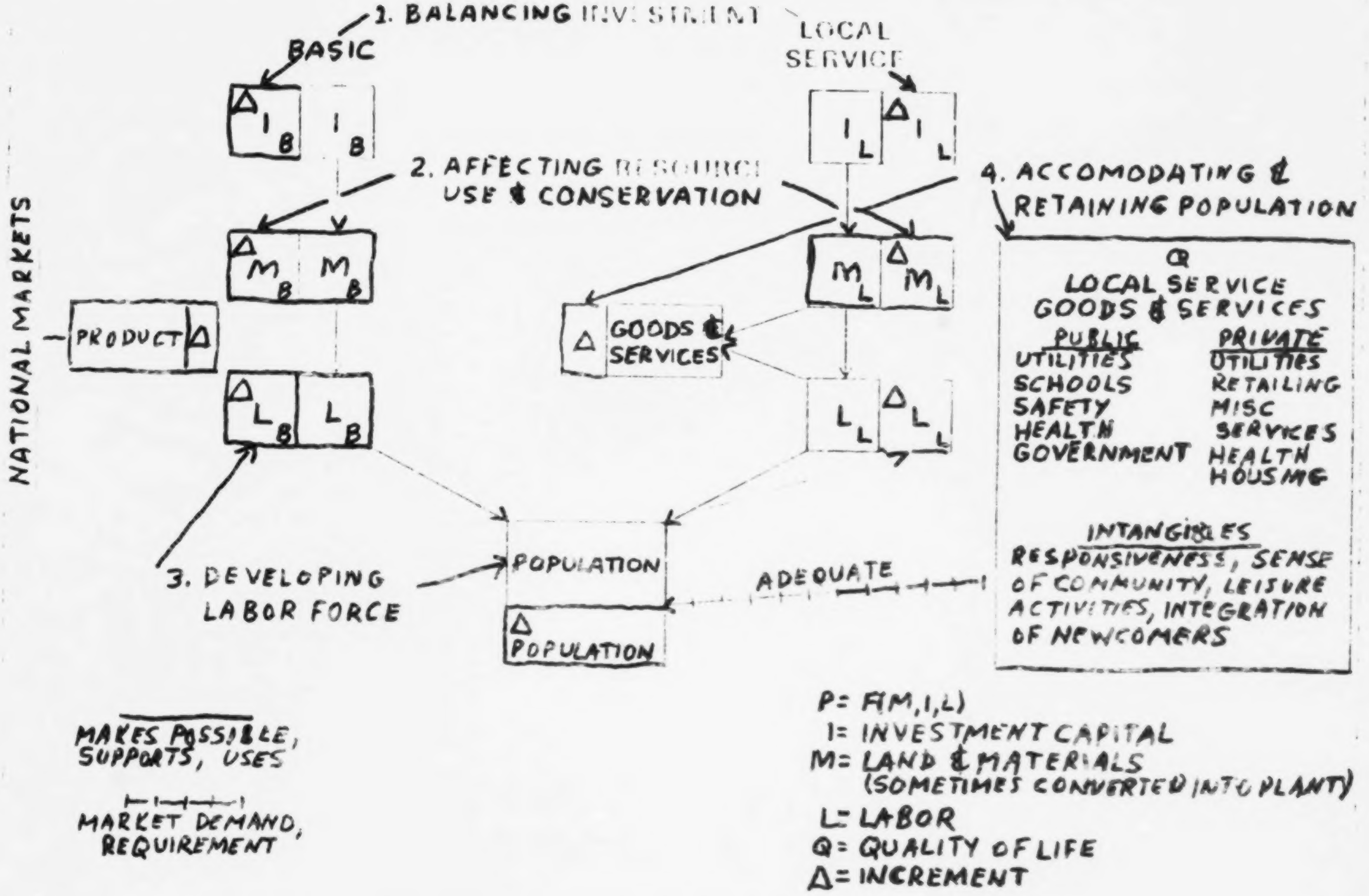

BASIC
LOCAL SERVICE
Δ I
I
Δ M
M
? L
L
I
Δ
M
Δ
L
?
NATIONAL MARKETS
PRODUCT ?
? GOODS & SERVICES
POPULATION
?
INADEQUATE OR INAPPROPRIATE
Q
LOCAL SERVICE GOODS & SERVICES
PUBLIC
UTILITIES
SCHOOLS
SAFETY
HEALTH
GOVERNMENT
PRIVATE
UTILITIES
RETAILING
MISC. SERVICES
HEALTH
HOUSING
INTANGIBLES
RESPONSIVENESS, SENSE OF COMMUNITY, LEISURE ACTIVITIES, INTEGRATION OF NEWCOMERS
MAKES POSSIBLE, SUPPORTS, USES
MARKET DEMAND, REQUIREMENT
P= F(M,I,L)
I= INVESTMENT CAPITAL
M= LAND & MATERIALS (SOMETIMES CONVERTED INTO PLANT)
L= LABOR
Q= QUALITY OF LIFE
Δ= INCREMENT

FIGURE VI
GROWTH MANAGEMENT FUNCTIONS


1. BALANCING INVESTMENT
BASIC
LOCAL SERVICE
ΔI_B
I_B
I_L
ΔI_L
2. AFFECTING RESOURCE USE & CONSERVATION
4. ACCOMODATING & RETAINING POPULATION
ΔM_B
M_B
M_L
ΔM_L
NATIONAL MARKETS
PRODUCT Δ
Δ GOODS & SERVICES
ΔL_B
L_B
L_L
ΔL_L
Q
LOCAL SERVICE GOODS & SERVICES
PUBLIC
UTILITIES
SCHOOLS
SAFETY
HEALTH
GOVERNMENT
PRIVATE
UTILITIES
RETAILING
MISC SERVICES
HEALTH
HOUSING
INTANGIBLES
RESPONSIVENESS, SENSE OF COMMUNITY, LEISURE ACTIVITIES, INTEGRATION OF NEWCOMERS
3. DEVELOPING LABOR FORCE
POPULATION
Δ POPULATION
ADEQUATE
MAKES POSSIBLE, SUPPORTS, USES
MARKET DEMAND, REQUIREMENT
P= F(M,I,L)
I= INVESTMENT CAPITAL
M= LAND & MATERIALS (SOMETIMES CONVERTED INTO PLANT)
L= LABOR
Q= QUALITY OF LIFE
Δ= INCREMENT

COSC
Colorado Open Space Council, Inc.
1325 Delaware Street, Denver, Colorado 80204

Regional Energy Environmental Impact Statement Seminar sponsored by the Denver Federal Executive Board, Denver, Colorado. March 6, 1975.

Problems in the Preparation of an Energy EIS -- a Conservationist's Viewpoint

V. Crane Wright
Colorado Open Space Council, Executive Committee; National Audubon Society, Member, Board of Directors; The Institute of Ecology, Trustee.

When I lived in Spain there was a beautiful cathedral in town with the then unique feature of confessionals in different languages. The sinners in town followed the letter of the religious law, they went to confession. It was the practice of the worst sinners to go to a booth designated with a language not their own. In this way they confessed to their hearts content and were descriptive in their wrong-doing. The poor confused priest understood not a word and was at a loss in putting these outpourings into any kind of religious perspective. And, if he did pull himself together enough to decree penance, the penitant was absolved because he couldn't understand what the penance was to be. The confessor was in the confortable position of having conformed to the religious law but did not have to bear any of the discomforts of the breaking of that law.
MORAL: The responsibility of a federal agency or of the Council on Environmental Quality under the National Environmental Policy Act cannot be put aside with a hasty after the fact Environmental Impact Statement and a few Hail Marys.

If there is no sincere attempt to comply with the spirit of the Act -- no sincere attempt to make sure the federal action is environmentally sound, then there might as well be no attempt at all.

The biggest problem you and I have today is that we all know, too well, what a Section 102 Environmental Impact Statement is supposed to look like.

We know it is supposed to inventory the existing fish, wildlife, vegetation, natural features, land and water uses and human activity in the area to be altered by a project.

We know it is supposed to honestly recite how the proposal will alter these existing systems. We know that if we alter or destroy anything of value to a sufficient number of people, we have to provide for spending a reasonable amount of someone's money to "mitigate" or "enhance" the remainder.

We know it must discuss in an educational and friendly manner a bunch of alternative courses of action that we don't want to pursue; or are too far-fetched to be taken seriously. Or, if all else fails, the alternatives are not in accord with laws or authorizations enacted in the 1870s or 1930s, that are too comfortable to change.

We also know what production of environmental statements has done so far. It has kept many of us gainfully occupied. And, it has not properly impacted our discredited, traditional decision-making process.

The problem is that everyone knows the National Environmental Policy Act requires an Environmental Impact Statement but no one remembers why!

The chief problem with present day implementation of NEPA lies in the agency's paying full attention to the technical procedures of Section 102 without paying attention to the basic purpose or spirit of the law in Section 101.

(The same problems show up in energy EIS's as appears in all other topical and programatic EIS's. Namely the EIS appears as a required exercise rather than a real evaluation of real alternatives of action. There should be no distinction between energy and other EIS's, as might be implied by my title.)

One of this conservationist's biggest problems with a Section 102 statement is that after the gestation and birth of the statement no one seems to think he is required to check it against the policies and goals clearly set forth in Section 101 of the National

Environmental Policy Act. I have yet to hear a Department head or Regional Executive acknowledge such a responsibility. The spirit of NEPA is being avoided even though the letter of Section 102 of the law is being met. Consequently, we are reaching the same old decisions although we are walking in new, more expensive, less comfortable shoes.

Section 102 of the Act opens by stating, "The policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act." (emphasis mine)

Section 101 established specific policy goals against which federal agencies were to judge their decisions. However, federal agencies do not yet appear to be concerned that their decisions, supplemented by environmental impact statements, may not comply with Section 101 policy. This situation exists in spite of the fact that if a decision is not judged against Section 101 in its presentation to the public, and found to be in accord with that section, it does not conform to the law.

NEPA was intended to cause a change in the way projects were undertaken, to explore alternative ways of meeting objectives and, when national objectives could be better met, to identify alternatives. We must begin to write Environmental Impact Statements in this context.

In this citizen's eyes, the role of the Council on Environmental Quality is threefold:

(a) to represnt the people's wishes to the President, not the President's apologies to the people,

(b) to guide the agencies toward pursuing actions that are in the long term public interest, and

(c) to see that the spirit of the ACT is implemented.

But, what do we see happening? Under Russell Train the accepted practice was not to comment on an EIS in writing. CEQ has never to my knowledge rejected an EIS -- and that does not mean they have all been acceptable. And even today when the President's Energy Message and his Budget Message request a facility siting bill which would be exempt from the Impact Statement requirements, we find CEQ protesting and opposing this action but not doing battle.

The agencies' role in NEPA -- again in my view -- is to
(a) serve the long term public interest
and to (b) protect the environment.

Nowhere does NEPA mandate that the government has to approve a project.

Nowhere does NEPA say the government has to insure a profit for private industry.

Perhaps a good guideline would be to ask, "Is it in the long term public interest to exploit this resource?" -- rather than "How can we best exploit this resource?" Such questioning would assure that the objectives of the development are purely and simply understood. Yet this is so seldom done.

The agencies preparation of an EIS should be the exhibition of a creative thought process -- a quest for a way to live within our means, a search for the real alternatives to meet the basic objectives.

I am aware of only one example of an EIS that did this. It was prepared by the Department of Interior's Bureau of Outdoor Recreation on a major recreation project in Texas, Canyon Lakes. To help decision-makers make knowledgeable decisions, indeed to force the decision, about this project the technicians did two things. First, they rated on a scale of 1 to 5 the degree to which the proposed project and its alternatives met the objectives of the proposed action. Secondly, they rated the project and its alternatives on the degree to which they met the policies established in Section 101 of NEPA. It clearly and distincly put the proposed project into perspective with its alternatives: (1) in meeting the objectives of the proposed project, and (2) in the Section 101 policies of NEPA. It was very clear that the project itself rated low on the list in meeting the NEPA objectives.

This environmental impact statement was simple and not over thirty pages; yet, as compared with many voluminous statements, it was clearly useful to the decision makers and the reviewing public in understanding the proposed project itself and the extent to which it met National Environmental Policies. I am not suggesting that a thirty page EIS is foolproof, but I am suggesting that this technique of going one step further is worth more than the usual many volumes and thousands of pages being prepared without it.

An EIS without this further comparison does not help the decision-maker significantly nor does it help force the decision. This further technique might also help determine, horror of horrors!, that the project, in any of its shadings, should not go through at all.

This technique appears simple but it is not. The fact that it has not been done commonly is very significant. It implies that those preparing EISs still don't know why they are preparing them and that they don't know or care what NEPA intended to achieve.

One of the very serious problems influencing the way an EIS is cast, is that often industry helps write the statement. They often are invited or request to be involved in the preparation of impact statements, especially energy EIS's. We think this is improper; it is not a function of their role.

It is our continued hope that the lead federal agency might write an objective description for a given proposed project; it is our conviction that industry cannot and has not. But, if we are to persist in this federal/industrial symbiotic relationship, I would ask that we follow the spirit of the times and disclose by featuring the particular industry as the lead or co-lead agency.

Another problem is a proprietary interest by an agency in its favorite projects and solutions.

To the administrators and chiefs in the agency hierarchy we must say we understand your susceptibility to developing a proprietary interest in the programs you conduct. At some point in time the phrase "for the good of the program" becomes confused with the phrase "in the public interest" in the administrators vocabulary. We understand but we do not accept that it is in the "public interest" to contour the spirit of NEPA, even though it might be good for career enhancement. The "public interest" is best served by complying with the letter and spirit of the law.

We, the members of the public (public being defined as the aggregation of the individual citizens who pay taxes and vote) believe we are ahead of our elected representatives and employed administrators or civil servants in understanding the need for hard practical solutions. We think our new directions of leadership through the ballot box and by forcing passage of NEPA are being largely ignored. Let us look at some sample actions by the people taken just in this State...by public petition.

The public provided a simple and workable solution to the problems of ever-escalating costs by voting down the 1976 Olympics.

The public also provided a policy statement to the AEC in regard to its future experiments in our State and underlined our unwillingness to accept by edict their activities.

Just to set the record straight let me state the citizen conservationists problems. The key word is "hustle". We have to hustle to find out about proposed actions as early as possible, before the decision to go ahead has been made and before the preliminary draft is being put together to justify that decision. Our role at the draft and final impact statement stage is one of response by raising questions. At these stages we are often listened to -- but rarely heard or answered. Perhaps CEQ could help in this regard.

All too often, there is another role we are forced to perform. After trying every avenue available to us to resolve problem areas we must, as a last resort, insist that our governmental agencies conform to NEPA through court action. We find this a particularly sore point. It should not have to be the function of the citizen to be the watchdog and the enforcer. And besides, it is doubly costly to us. We must hustle to find the money for the court action, not tax deductible, and we must hustle to pay our taxes with which the government lawyers and "experts" who line up against us are paid.

In conclusion, we have now become reasonably proficient with the Impact Statement preparation. We know the requirements of Section 102. It is time to move forward and to be responsive to Section 101 as it relates to 102.

It is time to live up to the spirit and the letter of NEPA and to recognize it as the full comprehensive law that it is.

Thank you.

REGIONAL ENERGY ENVIRONMENTAL IMPACT STATEMENT SEMINAR
March 6-7, 1975
Denver, Colorado

Practical Problems in Preparation of Regional EISs from a Federal Position

Daniel P. Baker, State Director
Bureau of Land Management
Cheyenne, Wyoming

I notice the agenda includes discussions on programmatic EISs, Regional EISs, multi-phase projects, and specific or individual energy developments. In trying to determine the proper orientation for my remarks, these topics that have been, or will be discussed by others, were noted, as well as the specificity of the title assigned me. I assumed that what was wanted from me was a discussion of some of the problems that confront a manager in preparing an EIS, based on the experience of our organization in developing the EIS for the Eastern Powder River Coal Basin of Wyoming. Whether this was a regional EIS or not is questionable.

Actually, our experience in Wyoming in preparing EISs and seeing them through final clearance with CEQ is rather meager. We have completed two, and a third is in process. These all involve non-government energy initiatives. In evaluating these industry proposals, we were obviously confronted with the need to make determinations as to whether the government's role involved a "major action" and whether such action would "significantly affect the environment." These are not always easy determinations for a field official. Experience is limited and guidelines and precedent not always too helpful. When the government's role is only to grant a small right-of-way having in itself a limited impact on the environment, but facilitating a major private project being developed on privately-owned lands, the nature of the EIS requirements become difficult to assess.

The most critical judgment for the responsible official involves the delineation of a project's scope, and the establishment of parameters for analysis. The relationship between environmental analyses and impact statements of specific private development proposes to so-called "programmatic" EISs, "Regional Analyses," and related actions involving other programs, is often hard to perceive, and desirable integration or correlation difficult to effect. For example, what do we really have in mind when we speak of a "regional analysis?" Is it actually an EIS? If so, what are its characteristics? Can it be oriented only to one or more specific project proposals, or must it consider the multiplicity of proposals for change that may impact a "region?" If it considers only a few similar or related proposals, is it really a "regional analysis" or merely an assessment of the cumulative impacts of the proposed developments? Shouldn't a "regional analysis" consider all of the proposals for development within a region regardless of their diversity or relationship?

Well -- let me depart from that line of thought and zero in on an actual EIS that was developed for the Eastern Powder River Coal Basin. This EIS embraced not only five definite site specific development proposals, but also included a broader analysis of the cumulative impacts of a number of existing, proposed, probable, and possible developments.

Four companies holding leases on federally-owned coal deposits in the Eastern Powder River Basin of Wyoming have submitted proposed mining and reclamation plans for their respective leaseholds to the U. S. Geological Survey for approval in accordance with existing federal law and regulations. Three of these plans involve new mines to be opened, while one covers expansion of an existing mine. Two of the mining plans filed involve lands near Gillette in an area under jurisdiction of the Bureau of Land Management. The other two mining plans are some 50 miles south of Gillette in the Thunder Basin National Grasslands under the jurisdiction of the Forest Service. Additionally, Burlington Northern, Inc., and Chicago North Western Transportation Company jointly applied to the Interstate Commerce Commission for authorization to construct and operate a new railroad linking an existing line near Douglas, Wyoming, with one near Gillette, Wyoming, some 113 miles in length. This line would provide a means of transportation for anticipated mining activity. Federal rights-of-way will be required for about 23 miles of the line where it crosses lands administered by the Bureau of Land Management, and the Forest Service.

A number of other plans for mining in the area have already been submitted or can be anticipated in the near future. Other developments may also be proposed for this area, many of which would require some federal authorization. Such facilities could involve power lines, mine mouth power plants, coal gasification plants, water supplies for various operations, road and communication facilities, as well as land for community expansion.

When considering the involvement of these four federal agencies--the Bureau of Land Management, Geological Survey, Forest Service and Interstate Commerce Commission, it is important to understand their responsibilities with respect to the actions proposed.

The Bureau of Land Management manages the national resource lands and their related resources. In the federal coal leasing program, one facet of BLM's operation, the BLM exercises the Secretary of the Interior's discretionary authority under the mineral leasing act to determine whether or not leases or permits are to be issued and, if so, under what terms and conditions. It is responsible for issuing leases and for formulating the surface, non-mineral resource protection and rehabilitation requirements to be incorporated in them. With respect to federal coal deposits where BLM has surface management responsibilities, and on private surface overlying federal coal, BLM advises the Geological Survey of the adequacy of environmental protection and rehabilitation aspects of all mining operation plans.

The Geological Survey through its Conservation Division is among other things responsible for geologic, engineering, and economic value determinations needed for federal coal leasing and for supervision of coal mining on federal lands under the terms of leases issued by the Bureau of Land Management. It approves operating plans which meet requirements of the mineral leasing act, regulations, and lease terms and conditions, including environmental and rehabilitation stipulations. It makes compliance examinations of operations under federal mineral leases and maintains records of operations of lessees, permittees, and licensees.

The Forest Service manages the national forests and national grasslands. Lands managed by the Forest Service are for the most part subject to mineral exploration and mining. Coal leasing is subject to the constraints and direction developed in multiple use planning, including environmental control and reclamation stipulations.

The Interstate Commerce Commission is an independent regulatory agency which acts on matters of national transportation importance under the Interstate Commerce Act. It regulates the surface transportation system by requiring prior authorization for the institution of, or expansion of, existing operations and for termination or consolidation of services. It administers its programs to recognize and preserve inherent advantages of different modes of transportation and to promote sound economic conditions by fostering competition among individual carriers and avoiding unnecessary and duplicative facilities. The ICC predicates it's findings upon a determination that the present or future public convenience and necessity require or will require a proposed service or operation.

In considering the specific development proposals previously mentioned, the four federal agencies determined that approval of the applications of the various companies would collectively constitute a major federal action, having a significant effect on the quality of the human environment. To protect the public interests most effectively, and to most efficiently meet the individual agency responsibilities under the National Environment Policy Act, it was jointly agreed that a comprehensive analysis was required and that a single environmental impact statement should be developed.

This, then led to the need to determine which agency should have lead responsibility for the overall project. Based on criteria of relative involvement, organizational capability, and through negotiations between the Secretaries, USDI and USDA, and the Commissioner, ICC, an agreement was reached wherein the Bureau of Land Management's Wyoming organization would assume lead responsibility.

Aside from recognizing that site specific analyses would be required for each application, a problem was encountered in determining the appropriate geographic area for which the cumulative impacts of potential development should be assessed. The decision was made that the basic study area for regional analysis was to be all of Campbell County and that part of Converse County north of the Platte River -- an area of over 5½ million acres. The area encompasses the eastern outcrop of the coal within the Powder River Basin and that area for which significant coal development was proposed or projected. Existing values of coal, other minerals, soils, vegetation, surface and ground water, archeology, aesthetics and their uses such as agricultural activities were analyzed within this boundary. However, since other impacts on the environment, such as air quality, wildlife migration, outdoor recreation, and social factors could not be arbitrarily held to this limit, a broader eight-county region was studied with respect to these values.

Projections on potential coal development and associated resource requirements were made to 1990 on a five-year interval basis. Forecasting indicators were based on company plans and information derived from other federal and state agencies.

The authority for the agency having the lead becomes a significant issue when the study team's structure is established, assignments made, and operations begin. The team structure used for the environmental impact statement on the Eastern Powder River Coal Basin of Wyoming was based on the principal of accountability. The EIS team was kept small and team leaders specifically identified to establish responsibility for timely output of study components. Other specialists were assigned to team leaders as required for specific aspects of the analysis.

The location of the groups involved varied. Most functioned from a central location in Cheyenne, but other specialists operated from their own offices in Reston, Virginia, Laramie and Douglas, Wyoming. [redacted] The argument for this arrangement was that research material was more readily available to the participating personnel at their own base.

There were several other items that were important to us in executing this assignment. These were essentially operational matters that were calculated to insure adherence to the timetable established by the Department.

A headquarters for the EIS team was established apart from the agency operating offices; all necessary equipment, supplies, etc., were made available; and office practices and routine administrative procedures established. Day-by-day schedules were developed and precise targets established for various study segments to insure that all components were produced timely on a coordinated basis with related material so that everything came together on specified dates to produce a total document for review.

After the study was lauched, the effort was publicized and input from all concerned individuals and organizations invited. Meetings were held with all companies known to have plans for development in the area. Company representatives and contractors were asked to provide data on their plans or projects and afforded an opportunity to meet team members who were interested in specific characteristics of the project or operating plans. These discussions established a liaison for continuing data exchange purposes.

A similar meeting was held with representatives of various conservation organizations and concerned environmentalists. The contribution of these individuals or organizations was minimal from the standpoint of data, but their views and assistance were very helpful in terms of data evaluation and study critique.

Many informal contacts by team members were made with other federal agencies to obtain data. During the public review process, several federal agencies asked for an extension of time and submitted comments to the team within the established deadline. I hesitate to mention it, but the notable exception was EPA who requested extensions for both the draft and final EIS but provided comments late in both cases.

A meeting was held with the Wyoming Governor to apprise him of the effort and to solicit support. Subsequently, a meeting was arranged with representatives of all relevant departments in the state government. State officials were provided the study outline, scope, team arrangements and timetable. Individual EIS team members met counterparts in the state government and arrangements were made for information and data exchange.

The Governor's clearinghouse was contacted and procedures established for obtaining the official state government comment and reaction.

The team provided continual information to the news media regarding the scope of study and progress on analysis and findings. This included press releases, television appearances, radio discussions and frequent visits to the team by members of the press.

The last week of June 1974, following issuance of the draft EIS on May 31st, three formal public hearings were held in Cheyenne, Casper and Gillette, Wyoming. About 550 people attended the hearings and 88 gave oral statements. In addition, 64 written comments were submitted. The public reaction at the hearings indicated a considerable concern over possible conversion facilities but general acceptance of an extraction and export policy. The hearings did provide comment and information that was helpful and utilized in revision of the draft statement. Some suggestions for improvement could not be accommodated owing to the lack of data and research results. As new study information was made available, it was integrated with the ongoing analysis. In most cases, the material was provided in the form of rough drafts by members of other study groups with warnings that the data would be subject to considerable revision.

The project was initiated in February 1974 with the final statement delivered to CEQ in October 1974 as scheduled. The estimated cost to the participating federal agencies to produce the six volume final document containing 2600 pages represented 3/4 million dollars and 28 man years of work.

Now I would like to highlight some particular problems encountered.

Owing in part to the different responsibilities of the four agencies -- management, technical assistance, and regulatory -- the objectives and management policies of the respective agencies are not comparable. In coordinating an interagency project of this type, the lack of commonality in objectives, policies, organizational capabilities, management practices, attitudes, etc., creates real problems in terms of developing a product that addresses individual agency concerns and meets individual agency standards. The agencies do not have a common approach to satisfy NEPA requirements. On joint agency statements a problem exists in weighing levels of involvement for determining lead responsibility when the actions, functions, concerns, and legal requirements may not be comparable. Also, varying delegations of authority among agencies result in decisions being made at different organizational levles. This complicates interagency communication and coordination.

With respect to internal operations, a problem is created by the disparity in time-frame between the federal budgetary cycle in relation to the timing of decisions by industry to proceed with large investments in development. Normally it takes a minimum of two years to shift emphasis of appropriations and manpower on a scale that is adequate to react and accommodate major industry proposals. When such lead time is not available, interim program adjustments must be made within the agency which have a serious disruptive affect on the pre-established priorities and commitments in regular base programs. Most companies do not provide agencies with firm plans this far in advance, nor can fund increases usually be obtained or even requested on the basis of what might happen. While this statement was produced timely, the impact internally on other non-discretionary programs was costly.

Continuing with operational problems - as anticipated at the outset, the dispersion of team members was not practical. There was general agreement later that all team members should have been located under one roof subordinate to the project manager as BLM had initially requested. There must be continual interaction between all groups and between individual team members on a daily basis. Those teams geographically removed from the team headquarters were continually playing "catch-up" by missing out on the daily coordinative activities and the overall effectiveness of the group was diminished.

An assumption is easily made that the lead agency has authority over team members from other organizations. However, the full extent, as well as the limits, of this authority must be spelled out clearly, well in advance. Study team members will otherwise attempt to serve two masters with varying requirements concerning priorities, commitments, etc.

The clearance process, too, was cumbersome and involved repeated modification of the EIS because guidance and experience in developing environmental impact statements of this magnitude was lacking. Expectations for the document varied considerably with virtually every clearance point involved in the process. Also, with interagency involvement, informal and formal clearance lines of authority are not well defined. For example, does the lead agency have full authority for clearance and issuance of an EIS, or should the supporting agencies be required or afforded an opportunity to approve and sign off prior to issuance?

The EIS team was instructed by the Department to obtain clearance from the other Department of Interior bureaus such as National Park Service, Bureau of Outdoor Recreation, Fish & Wildlife Service, Bureau of Reclamation, etc., prior to issuance of the draft so that the statement could be issued as a Department of Interior product. The team learned, however, that these bureaus, although willing to contribute and make input on an informal basis, were unwilling to formally commit themselves to the document.

In this case, both draft and final statements were cleared in (1) field headquarter offices, (2) participating bureau and commission offices, (3) the Departmental Solicitor's Office, (4) the Department's Office of Environmental Project Review, and (5) the National Historic Advisory Council Office. Of the many issues raised in the review process, some deserve special comment.

Factors such as geographic area, time-frame, development assumptions, and forecasts are obviously most significant in delineating scope of study. These are subjective judgments and thus are sometimes difficult to resolve on an interagency basis. Also, it is sometimes difficult to pin down participating agencies on the degree to which they will commit funds and manpower to the effort. The relationship of the primary issue of coal development to other activities, programs or development proposals would also seem to be an appropriate factor in delineating the study area or the scope.

The Eastern Powder River EIS was strongly criticized with respect to the time frame for completing the statement and selection of geographic size in relation to other studies and analytical efforts then in process. To bring some perspective to the situation, it was learned that over 50 concurrent studies were being developed by a dozen federal entities, at least seven consulting firms or privately sponsored groups, eight state government entities and at least four industrial firms. The range of studies included national land use information studies, regional analyses covering five states, discipline oriented studies on water, strip mining, soils, plants, etc., and site specific studies on a given mine operation. They covered many subjects including minerals, water, atmosphere, socio-economics, demography, land inventory, wildlife, housing and archeology. Predictions for completion of the studies ranged from several months to several years. It was considered impractical to delay or postpone the effort indefinitely.

In dealing with alternatives to the proposed actions, a comprehensive quanitifed analysis was developed with respect to the site specific proposals such as route locations, modes of distribution, modified mining plans, extraction methods, utilization processes, etc. However, in the broader sense of total cumulative projected development, serious questions arose with regard to how far the agencies should go with in-depth alternative analyses considering time and cost. For example, comments suggested that the report address such major policy and environmental issues as justification of national coal demand and the prospects for a successful national program for conservation of energy. One top management review comment insisted that the statement contain an analysis of trans-basin transfers [redacted] of water across the state including impacts on the lower Colorado River system in Arizona and California. Here again, judgments had to be rendered in terms of reasonableness and practicality.

When outlining mitigating measures, we were asked to explain in the report what actually would be done in this regard. This caused some problems. When mitigation such as off-site wildlife habitat development, was dependent upon availability of appropriations, it was not indicated that it would be accomplished. Similarly, where agencies either did not have a program for regional monitoring established, nor the responsibility assigned, such activities were not inferred as certainties. Specific stipulations for site development have not yet been developed even now since it is not known whether the environmental impact statements are adequate to support a decision regarding development. If and when affirmative federal action decisions are made, precise stipulations will be developed with the company, surface owners, and federal agencies responsible for mining, reclamation and land management action. To do so now would be a premature commitment of funds and manpower since project authorization is not assured. Also, at this time, we would not know, for example, for which route of the rail line we should develop specific stipulations. At such time as stipulations are developed, however, they will be attached to the approval and be subject to annual review and amendment as necessary to achieve the stated reclamation and environmental protection objectives.

A criticism leveled at the statement was that the recommendations of the federal action agencies with respect to disposition of the applications were absent. The guidelines used in preparing the statement, however, did not include such a requirement. However, a draft decision option document was developed by the various agencies which contained not only such recommendations, but also cost-benefit information. With regard to the latter item, economic analyses of the proposals were not included in the statement. This again, was in accordance with the guidelines furnished.

Now, one final item — whenever data was not available during development, this fact was clearly indicated in the report. Generally, information required for site specific analysis was available and of acceptable quality. We did have a problem, however, in obtaining detailed information on the broader regional area. The land management agencies, universities and other sources did provide comprehensive information with respect to natural resources. However, data relative to archeological values, ground water supplies, aquifer draw down, toxic trace elements, intensive soil surveys to estimate reclamation success were not available. There were also uncertainties in the development plans of industry owing to changing economics and vague energy policy. This was, in fact, a major problem as industry development plans were continually being revised. Coal production estimates over the fifteen year time frame also fluctuated. The lack of information, as well as changes in plans and forecasts, naturally reduced the quality of impact analysis. With respect to models that would predict future impacts, fairly good information was available for steam-electric generating plants, coal gasification plants and waste disposal systems. Adequate data was not available on liquefaction plants, air diffusion models, water supply--consumption budget models and water quality monitoring models.

Notwithstanding the comments, suggestions and criticisms generated by the statement, the overriding concern and theme of the report was that the intent and spirit of NEPA be met in a manner that displayed a good faith approach by the participating agencies.

We think that the analysis of cumulative impacts - or regional analysis - provides an umbrella under which certain specific federal actions can be analyzed. But a study of this type is not static. As more information becomes available, as the quality of data is upgraded, as new technology and methodology evolves, as industry proposals become more firm and as energy policy is clarified, the regional analysis will be undergoing revision and update. For these reasons, obvious deficiencies currently contained in the report are not considered a fatal defect to its utility. Decisions cannot be deferred indefinitely. Interim documentation does now exist upon which to base specific action analysis.

Stearns-Roger

REGIONAL ENERGY ENVIRONMENTAL IMPACT STATEMENT SEMINAR
March 6 - 7, 1975

PRACTICAL PROBLEMS IN PREPARATION OF REGIONAL EISs
CONSULTING ENGINEER'S VIEWPOINT

Dr. J. Louis York
Chief Environmental Scientist
Stearns-Roger Incorporated

There are two basic problems facing the consulting engineer in preparation of an Environmental Impact Statement: money and trust. And, as I will explain, the trust, or lack of it, is largely rooted in money. No matter how anyone wishes to look at it, a good Environmental Impact Statement (EIS) costs money, and a lot of project calls for a lot of money.

The first point which must be dealt with is the relationship of consulting engineers, and environmental consulting firms in general, to the actual preparation of the EIS. The law makes it quite clear that the EIS must be prepared by the federal agency taking an action and designated as the lead agency. Thus a consulting engineer can only provide basic resource documents for the use of the agency and the public.

The guidelines prepared by the Council on Environmental Quality require that each agency develop and publish its own specific guidelines. These guidelines are intended to inform the agency employees and the public as to what will be considered and discussed in the EIS. Most of the agency guidelines make no provision whatsoever for documents submitted by a non-federal applicant for action.

In practice, the federal agencies vary widely in their use of and reliance upon information supplied by the applicant and his consultants. Some agencies almost forbid the acceptance of information supplied by the applicant, and usually accept only environmental baseline information. Other agencies employ all information submitted by the applicant, including estimates of impact. This difference in approach among the agencies is a function of their philosophical approach to their responsibility to the environment and their manpower and budgetary capability for adding this difficult task to their ongoing responsibilities. Many scientifically oriented service agencies would consume half their personnel in writing and reviewing EISs if they received no help from the applicant.

Another factor affecting the agencies' approach is the attitude abroad in the land that a government agency can do no wrong, whereas a profit-making organization and its consultants can do no right. We often find this basic attitude underlying comments and review procedures conducted by many of the citizen organizations who have appointed themselves guardians of the environment.

Faced with this fundamental attitude, every consulting organization accepts the fact that nobody loves us. The environmental organizations make it clear that we wear black hats because we accept money for our services. The government agencies feel somewhat threatened by our activities, if they believe they are the repository of all significant environmental information, or if they are sensitive to criticism by citizen organizations because they listen to tax-paying applicants. Industrial firms are not pleased with their decision-making processes being fenced in with complex and time-consuming legal procedures.

Speaking as a representative of these consulting organizations, I am fully aware of this unpopularity, but most of us rise to that challenge. Our position is simple: we are obligated to discover the truth about environmental impacts, we hope and expect to remain in business and grow, and we are subjected to vigorous and informed cross-examination in public and under oath.

If we accomplish our task properly, everyone stands to gain. If we do a sloppy job or if the procedural activities are interfered with for emotional and unsubstantiated reasons, everyone stands to lose. One of the negative slogans of the Sierra Club is "Not blind opposition to progress but opposition to blind progress," and we consider it our duty to remove the blinders in the hope that the opposition will become honest.

I stated earlier that a primary objective was to discover the truth about environmental impacts. This is much easier said than done. Our collective knowledge of environmental interrelationships is fantastically weak. Almost every project has produced documents which furnish biologists with more information about the ecology of a relatively small area than they have ever had before. Many university libraries are faced with a new dilemma; the huge increase in volume of biological knowledge resulting from environmental impact studies is adding to their existing problem of keeping up with the bulk published in all fields. It would be ideal if we consultants and the governmental agency personnel needed only to turn to the libraries and assimilate the biological data we need on a particular region. This dream will remain unfulfilled for decades to come. The principal reason environmental studies are so time-consuming and so expensive is the need to gather environmental baseline data in the field.

Our first approach is always to scour the public literature for all information about a specific area of concern. Sometimes our researchers spend several weeks doing this, sometimes they spend only a few days, but the result invariably is a handful of small fragments of a shadowy picture. We share the problem of the anthropologist who attempts to reconstruct the physical features and lifestyle of prehistoric men from two teeth, some pieces of bone, and an arrowhead.

Our lack of information and process of inductive reasoning is somewhat more handicapped than the anthropologist's. Our results are not always looked upon as forward steps in knowledge, but are under continuous attack by critics who disagreed before both sides of the discussion were aired.

We consider that our environmental impact studies should be tied to the same framework within which the agency writes the impact statement. We are thus concerned with the same overall sections of the program: baseline information, description of the action, estimation of the impact of the action, and evaluation of alternative actions.

Environmental Baseline Information

The existing environment generally can be characterized under the broad headings of earth sciences, biological systems and human environment.

The earth sciences we define as primarily geology, soils, hydrology, and meteorology. Usually we find that the geology of the area has been explored and identified during the early conceptual studies for the proposed development. Obviously, developments based upon mineral formations, such as oil shale or coal, are rooted completely in geology, and such information is easily available. Soils information is also known to a reasonable extent, thanks to the extensive program which has been conducted over many years by the Soil Conservation Service. This is particularly true of the top three feet of soil, but we frequently have to study soils deeper than that when overburden disposal and reclamation are significant parts of the task. Hydrology is less well known, particularly the magnitude and interaction of underground aquifers. Much information is available on surface water flows and quality as a result of long-term programs carried on by the U. S. Geological Survey. Groundwater is usually the responsibility of states, since aquifers are usually intrastate rather than interstate.

General meteorological information is available through the data-gathering network of the National Weather Service, but large segments of ignorance exist regarding micro-meteorology. Since a primary environmental concern with meteorology is atmospheric pollution, we need extensive information about the lower thousand feet of the atmosphere, whereas primary concerns of the National Weather Service are storms and aircraft operational information, almost always above 1,000 feet. This means that we usually must install and operate micro-meteorological and air quality instrumentation, if atmospheric pollution is likely to be important. This need complicates the studies greatly, because such data must be gathered throughout the seasons of the year, often for more than one year, in contrast with our ability to evaluate the other earth sciences in a relatively short time. This time requirement, plus the sophistication of the instruments, contributes significantly to the cost of gathering baseline information.

Biological systems are usually divided into terrestrial ecology and aquatic ecology. Botanists and zoologists have devoted entire lifetimes to studying single watersheds, or mountainsides, or prairie patches, therefore we find available information to be either quite extensive or quite superficial. This detailed approach is partly caused by the emphasis by academic biologists--and until recently there were few others--upon identification and classification of species. The advent of environmental impact studies has further stimulated an increase in ecology, or interaction of all living species, and a decrease in taxonomy as a prime objective of biological research. The whole concept of environmental impact studies is founded upon interaction of plants and animals, therefore a great deal of data-gathering effort must be concentrated in biological subjects. Again work is necessary through all the seasons by many different specialists. The shortage of people able to interpret and interrelate the mass of information gathered by these specialists results in final evaluation by a team, rather than by one individual.

The human environment is a name for the interaction of human beings--past, present and future--with the non-living and living systems. This involves history, archaeology, economics, and society. The underlying theme must be that all of man's actions involve exploitation of the natural environment. Since Environmental Impact Statements are written by human beings and evaluated by human beings, all of our natural biases come into conflict at this stage. This is most strongly evident in the tug-of-war between extraction of natural resources and preservation of untrammeled wilderness. Another way to express the confrontation would be that the people in every community are incapable of living in isolation from other communities, and must trade with other communities. However it may be measured, this trade can offer the other communities nothing more than extracted natural resources or human skills acting upon such resources. We must not forget that each and everyone of us is ultimately dependent upon use of natural resources. The problem addressed in Environmental Impact Statements must be the quality of the way such resources are used, not whether they are used.

Description of the Action

A consultant working closely with industrial firms planning some action may have certain advantages over either the citizen groups or the government agencies in developing information to describe the proposed action. These advantages arise out of the confidentiality of the relationship between an industrial firm and a consulting engineer, whereby the consulting engineer may assist in evaluating alternatives, planning action, and dealing with public agencies while allaying fear of disclosure of critical plans which are non-essential to the EIS. For example, site planning and possible land acquisition is subject to instant escalation of prices if the entire program is disclosed prematurely. This must be balanced against the need for extensive knowledge of the area before an EIS can be prepared, and the further concern that the EIS procedures must be completed before approval for the entire project is obtained. However this dilemma is resolved, it will add to the cost, all of which will be paid by the public eventually.

An Environmental Impact Statement is a comprehensive report, and as such it follows the rules of good reporting, of which an important one is the need to know the limits of the knowledge. In order to know the limits, the field of knowledge must be more complete than the EIS alone. This reasoning leads us to the position that basic impact documents may rely upon information which may not be essential to the EIS, but which may be harmful to other activities if disclosed prematurely. The citizen groups and the government agencies are not bound by confidentiality agreements, often they cannot be so bound, but the consulting engineer is so bound. In addition, citizen groups and government agencies have punitive powers which can be used against activities for which they have no direct true responsibility.

Basically, many such citizen groups and agencies express openly their mistrust of industrial firms, and simultaneously the industrial firms have sufficient bad experience to create mistrust of the public groups. In such a situation, there are some consulting engineers who are the only ones truly disinterested and qualified to thread the middle ground and develop the true answers.

Regional development increases the difficulty of acquiring information on specific actions, since by its very nature, it involves equivalent and competitive specific actions by specific companies. Under these circumstances, the reluctance of companies to disclose wide-ranging and ultimate plans is heightened. The confidential aspects of a consultant's relationship with companies is even more important under these circumstances, because the concerns of companies regarding the punitive power of citizen groups and government agencies is now compounded by an increased need for secrecy in the competitive business world.

Estimation of Environmental Impact

The prediction of the effect of a proposed action upon the environment is the part of a study built up from facts by rational application of theory and experience. In this phase all the experts must be brought together and extrapolation into the future is developed by educated opinion. Since most of our concerns are with the effect upon living plants and animals, including people, and since living things have fantastic adaptability, this entire operation is fascinating and frightening at the same time. It is precisely here where the diversity of experience gained by consultants who work in wide ranges of activity is most useful. It is also here where the emotional and honestly concerned citizen can be of most value or of most harm. This area is clearly one which requires coordinated effort by a team of experienced personnel.

Alternative Action

Most proposed actions have many alternatives to the whole and to details within the whole. Each industrial firm must and does examine its complete range of choices, from doing nothing and concentrating its resources on other things to forging ahead on several parallel technological paths. A highly significant aspect of this decision-making process is economic, a fact which tightens the security psychology of each firm toward disclosure of the entire story of alternatives. The particular concerns of each firm, the delays imposed by environmental needs, and the actions of other firms in the region all contribute to modifying the impact of regional development. For example, some studies have discussed the millions of tons of coal which could be mined in the Northern Great Plains, the thousands of megawatts of power which could be produced from this coal, and the billions of cubic feet of gas or liquid fuels which could be produced from this coal. Such predictions are frightening indeed, assuming that all of these things will develop simultaneously and tomorrow. In actual fact, the availability of money, water, and equipment will cause many of these things to be mutually exclusive. Coal mined for export to other regions will probably be used to generate power or produce alternate fuels in those other regions. If so, it is unlikely that the power generation or that fuel production will occur in the region where the coal is mined. These activities will occur over a period of decades, perhaps a century, rather than all appearing fullblown during the lifetime of those in this room. The conjecture of sequence and likelihood of such activities make evaluation of alternatives exceedingly difficult and exceedingly fascinating. In any case, the final estimates must be evaluated in the light of this imprecision.

SUMMARY

The position of the consultant is one of higher accessibility and trust than other participants in the process, at least on the part of the industrial firms. The apparent lesser degree of trust in the minds of citizen groups leads to frustrations and difficulties of communication. On balance, however, the consultant has a special capability which needs to be understood and utilized in the entire process. A consultant's fulltime involvement in the process makes for a wealth of diversified experience which is valuable in evaluation. In order to maintain that fulltime involvement, the consultant must be paid for his services. Only the industrial firms are in a position to provide those funds, and therefore the consultants are usually associated with such firms in the overall study. It is worth pointing out that such consultants would be perfectly happy to be paid by citizen groups or the government agencies, and that the nature of their work is such that the results would not be noticeably different. The consultants plan to continue working in the field and must maintain their reputation and credibility to do so.

PROGRAM IMPACT STATEMENTS: CEQ'S PERSPECTIVE

Remarks of Gary Widman
Conference on Energy and Environment
Denver Federal Executive Board
Denver, Colorado, March 7, 1975

It is always a pleasure to return to Denver to talk on environmental law. The agencies and the Bar in this city have always seemed more responsive, and more interested in working to shape environmental law than in many other areas.

As a former professor of environmental law at D.U., it is also a pleasure to talk with my ex-students. The E.P.A. Regional Office that set up this meeting has several. Your chairman, Cooper Wayman, Director of the Office of Energy Activities; Jim Sanderson, Regional Counsel; and Bill Geise, Director of the Impact Statement section are all sources of pride to their former professor.

A great deal of conceptual confusion, almost a "conceptual mush" surrounds the term "program statement." But before today's sessions are ended, we hope that most of that confusion will have gone.

As the first speaker, I would like to take a few minutes to help you get the feel of the "program statement" concept, and to open the attack on that conceptual confusion. (I might note that the Council expects to issue a legal memorandum on certain program statement issues in the near future. So the views I give you today must still be treated as preliminary; the official Council position will be presented in the Legal Advisory Memorandum that is now in preparation.)

The term "program statement" refers to a statement that describes the impact of more than one Federal action. But it is important to recognize that the Federal actions that are covered may be grouped together for different reasons and to satisfy different needs. In their written opinions, the Courts have not yet distinguished the different reasons why groups of actions might be covered by single statements, but in order to project the legal consequences, it is absolutely necessary to understand these differences in classification. When the differences in the needs for the statements are understood, differences in their probable legal consequences can be more easily predicted.

1) The Generic Class

A single statement may cover a group of similar Federal actions, (perhaps at different locations in the country) where each action, if considered alone, would have a significant impact that by itself requires preparation of an impact statement. These impacts would not be of the site-specific type.

In this class, the program statement is primarily a governmental economy measure, designed to save time and money by eliminating statements that raise duplicate issues, and generate similar comments and responses. One example is the AEC (now NRC) proposal for generic statements on certain standard model nuclear power plants, that could be constructed in various locations across the country. Appropriate issues that might be covered in the statement would include national need for the nuclear energy, demand on uranium reserves, design and safety of the standard reactor model under consideration. This institutional device for focusing on a single national examination of common issues obviously carries many benefits of economy and efficiency for the agency. The advantages for the agencies do not necessarily create problems for environmental groups. From the environmental side, this technique has an advantage in that these typically underfunded environmental groups can marshal and focus all their nationwide expertise and resources on a single statement, and a single Federal decision. They can prepare a comprehensive review of the technical issues, make valuable contributions to the decision-making process, and see the issues settled in a national setting.

At the same time, such a statement may also create a problem from that perspective, in that laymen and grass roots citizens groups may have less interest and involvement with the decision. An announcement in the Federal Register may mean nothing to a citizen group that has not yet heard of plans for a nuclear plant in its area. The issues will be decided in geographically remote Washington, D.C.--a place where the Congressmen, industry representatives, environmental representatives and all the experts will battle it out. As a result, the issues are less likely to be raised in the local meetings of the League of Women Voters or the City Councils.

If a program statement is to be used for these reasons of agency economy and national focus, then certain legal consequences are likely to follow. Because the statement does not deal with impacts on particular geographic sites, all site-specific impacts which are themselves significant will also require statements. To the extent that any single site does not fit the hypothetical assumptions used in the single nation-wide statement, there may be a need to re-examine the impacts previously described for the hypothetical, but different, type of site.

To further illustrate, the case that directed the BLM to prepare site-specific statements on certain grazing leases may reflect a similar need to consider site-specific problems in a statement where generic actions create such impacts. [N.R.D.C. v. Morton, ___ F.S. ___; 7 ERC 1335 (D.C. 1974)]

The legal issue most frequently raised is the question whether a program statement is required in any particular case, or whether an agency is free to prepare statements on each individual action. This is the class of cases where the agency could be given the greatest discretion in determining whether to proceed with program or individual statements. No impact will go unreported, and all issues will be considered by the agency and the public in either case. For all concerned, the economies and benefits of a single statement may well outweigh the problems that this type of statement might raise. There is less reason here, (when compared with other types of program statements) to compel an agency to use either program or individual statements against its wishes.

2) Regional Statements

A second, but related, class is the program statement designed to cover similar Federal actions in a defined geographic region. This class also assumes that each action, by itself, would be sufficiently significant to trigger the requirement for an EIS. On similar reasoning, if it could be established to the satisfaction of all, that the impacts of each action were the same, or so similar that they could be adequately described by a single document, then a program statement could be appropriate. But let me add a work of caution by noting that we have no example of a case that clearly falls in this class, that has also been approved by appellate courts. The problem is that each piece of land is different, and it is not easy to find a setting where the geographic factors are so similar, that the actions can be adequately described without additional site-specific statements. But with the caveat that such a statement may be difficult to prepare, the legal reasoning and consequences that apply to the first class (generic statements on national issues) could with equal logic apply to statements of regional scope.

3) Cumulative Impacts

Frequently, statements covering similar actions in the same region involve an added factor, and whenever that factor is present, the agency is brought into the third class of program statements. That factor is significant cumulative impact. With this category we can expect to leave the area of liberal agency discretion in determining whether a program statement is to be prepared, because a more crucial issue is at stake. NEPA requires a statement whenever agency actions cause significant impacts, and it is important to realize that many, probably most, of the serious environmental impacts result from the cumulative effect of many different, but individually "insignificant" actions. Smog is not caused by one car, and overgrazing is not caused by one sheep. But the cumulative effect of numerous Federal actions, (such as the granting of numerous permits for grazing many sheep in a limited area), can raise serious environmental problems. (For those interested in a discussion of this potential tragedy of incremental insignificant impacts, I strongly recommend Garrett Hardin's article, "Tragedy of the Commons" that is now widely anthologized in environmental literature.)

In cases where the cumulative effects of a class of substantially contemporaneous actions within the control of an agency is significant, (even though the impacts of individual actions may not be significant), it is reasonable to expect that courts will require a program statement, simply because there is no optional way for the agency to comply with NEPA.

4) Consecutive Actions

The final class of program statements are those required because of consecutive or serial effects on agency decisions. If the effect of an agency decision will be to foreclose some options that would otherwise be available for later decision, and the options remaining open could have a significant environmental effect, then a program statement will also be required. This is the thrust of the landmark

SIPI case, which ordered a statement on certain research, long before the time when the results would physically affect the environment. [Scientists' Institute for Public Information v. AEC, 481 F.2d 1079, (D.C. Cir. 1973).] Highway cases involving segmentation have similar rationales. [See Conservation Society v. Secretary of Transportation, ___F.2d___, 6 ERC 1236 (2d Cir. 1974).]

The reasoning here, of course, is that NEPA was intended to cover all the environmental effects of Federal decision making, and not just the immediate effects. As a statute intended to turn the attention of decision makers to the longer term future, and to produce a better environment as a result of that redirected focus--it follows that where the options of later decisions are affected by the consequences of decisions today, and where the effect may be to foreclose less harmful alternatives, a statement is required.

The CEQ role in the program statement process differs little from the usual statement review. CEQ is more likely to review a program statement than an individual because of the significance of the collective issues that are covered. In our review, we will check to insure that the concerns of the States have received satisfactory attention. In other respects, the review process is substantially the same as for statements on individual actions.

With this backdrop, we can proceed to more specialized program statement issues.

After the other panelists have spoken I would be happy to take questions on program impact statements.

PROGRAMATIC IMPACT STATEMENTS

Frank B. Friedman
Atlantic Richfield Company
Los Angeles, California

In the past several years numerous cases have been decided on the issue of whether a Programatic or Regional Impact Statement is required prior to the permitting or approval of various dam, highway and energy related projects. Attempting to counsel on the need for such a statement is analogous to Justice Stewart's difficulties in trying to define obscenity. He found that the easiest means of defining obscenity for him was to simply state "I know it when I see it". [1] The Council on Environmental Quality (CEQ) has attempted to go beyond a "I know it when I see it" type of definition to include in its Guidelines some form of shorthand guide for the Federal Agency in making such determination. Thus, in Section 1500.6(d)(1) of the Guidelines, [2] CEQ details its assumptions:

> "Agencies should give careful attention to identifying and defining the purpose and scope of the action which would most appropriately serve as the subject of the statement. In many cases, broad program statements will be required in order to assess the environmental effects of a number of individual actions on a given geographical area (e.g., coal leases), or environmental impacts that are generic or common to a series of agency actions (e.g., maintenance or waste handling practices), or the overall impact of a large-scale program or chain of contemplated projects (e.g., major lengths of highway

---

[1] *Jacobellis v. Ohio*, 12 L.Ed. 2d 793, 804 (Sup. Ct. 1972).

[2] 40 CFR 1500.6.1.

> as opposed to small segments). Subsequent statements on major individual actions will be necessary where such actions have significant environmental impacts not adequately evaluated in the program statement."

Section 1500.6(d)(2) 3/ is even more detailed in dealing with major technological research and development programs. Analysis of these Guidelines and the cases indicates some trends developing in determining the need for such a statement. Prior to summarizing these trends it is necessary to examine the case law.

In this paper I use the term "programatic" and "regional" interchangeably as a shorthand form. However, conceptually, this is not correct. The assumption of the Guidelines is that a regional statement "may be necessary to assess the environmental effects of a number of individual actions on a given geographical area" 4/ if this kind of analysis "would most appropriately serve as the subject of the statement." 5/ However, the so-called regional statement is normally in the context of a "program statement" and is treated as such in the Guidelines. 6/

3/ 40 CFR 1500.6(d)(2).

4/ 40 CFR 1500.6(d)(1)

5/ *Ibid.*

6/ This was also recognized in *Sierra Club v. Morton*, Civ. Action No. 1182-73, D.D.C. decided February 14, 1974, *appeal pending*, slip. op. at 4 where the Court indicated "There is *no existing or* proposed Federal regional program, plan, project, or other regional "federal action" within the meaning of NEPA Section 102(2) for the development of coal or other resources in the area defined by the plaintiffs as the "Northern Great Plains region." (Emphasis in original)

Scientists' Institute for Public Information, Inc. (Sippi) v. *AEC* 7/ was the first case that discusses the concept of the Programatic Impact Statement in detail. That case involved the Commission's Liquid Metal Fast Breeder Reactor Program, the Commission arguing that the program was at too early a stage in development for a programatic impact statement.

The Court disagreed however, noting that there had been a 10 Volume Liquid Metal Fast Breeder Reactor Program Plan already completed, that there clearly was a program involved and the Commission was committed to its ultimate completion. 8/

Because of the significance of the *Sippi* case in the merging case law in this area, it is necessary to discuss this case in detail. Initially, in its opinion the Court indicates clearly its reasons for its conclusion of the need for a broad program statement:

> "Taking into account the magnitude of the ongoing federal investment in this program, the controversial environmental effects attendant upon future widespread deployment of breeder reactors should the program fulfill present expectations, the accellerated pace under which this program has moved beyond pure scientific research toward creation of a viable, competitive breeder reactor electrical energy industry, and the manner in which investment in this new technology is likely to restrict future alternatives, we hold that the Commission's program comes within both the letter and spirit of Section 102(c) [of NEPA] and that a detailed statement about the program, its environmental impact and alternatives thereto as presently required." 9/

7/ 481 F.2d 1079 (D. C. Cir. 1973)

8/ 481 F.2d at 1083 (D.C. Cir. 1973)

The Court's reasoning in approaching its determination is quite significant. Judge Wright indicates his belief that the legislative history of NEPA indicates "actions" [in the term "major federal actions significantly affecting the quality of human environment" in Section 102(c) of NEPA] refers not only to construction of certain facilities, but includes "project proposals, proposals for new legislation, regulations, policy statements or expansions or revisions of ongoing programs. : 10/

Judge Wright concludes that "development of the technology serves as much to effect the environment as does a Commission decision granting a construction permit for a specific plant. Development of the technology is a necessary pre-condition of construction of plants." 11/

Assuming therefore that technology does have a significant effect on the quality of human environment, the next question is when such a statement should be written. Judge Wright concludes, "To wait until a technology attains the stage of complete commercial feasibility before considering the possible adverse environmental effects attendant upon ultimate application of the technology would undoubtedly frustrate meaningful consideration and balancing of environmental costs against economic and other benefits. Modern technological advances typically

---

9/ 481 F.2d at 1082 (D.C. Cir. 1973)

10/ 481 F.2d at 1088 (D.C. Cir. 1973)

11/ 481 F.2d at 1089 (D.C. Cir. 1973)

stem from massive investments in research and development . . ." 12/ Judge Wright further relies on conclusions in a CEQ memorandum which indicated that broad program statements will be appropriate in cases where "environmental implications and research activities have reached the stage of investment or commitment to implementation likely to restrict later alternatives."13/ Thus, "the manner in which we divide our limited research and development dollars today among various promising technologies in effect determines which technologies will be available, and what type and amount of environmental effects will have to be endured, in the future when we must apply some new technology to meet projected energy demand." 14/ The Commission argued, however, that at this stage of the program to try to determine the environmental effect in detail would be extremely difficult. 15/ Judge Wright concludes that "NEPA is not a straight jacket" 16/ Recognizing that you cannot develop a statement with the same detail on LMFBR power reactors in the year 2000 as "another agency might have to forecast increased traffic projection likely to be caused by a proposed highway", 17/ Judge Wright concludes that "one of the functions of the impact statement is to indicate the extent to which environmental effects are essentially unknown . . . reasonable forecasting and

---

12/ 481 F.2d at 1089 (D.C. Cir. 1973)

13/ 481 F.2d at 1090 (D.C. Cir. 1973)

14/ Ibid.

15/ 481 F.2d at 1091 (D.C. Cir. 1973)

16/ 481 F.2d at 1092 (D.C. Cir. 1973)

17/ Ibid.

speculation is thus implicit in NEPA, and we must reject any attempt by agencies to shirk the responsibilities under NEPA by labelling any and all discussion of environmental effects as "crystal ball inquiry."18/ Nevertheless, Judge Wright recognizes that a statement to be adequate need not attempt to cover every effect and "ought not to be modeled upon the works of Jules Verne or H. G. Wells."19/

Thus, assuming that such an impact statement would be required, based on the considerations discussed by Judge Wright, the next issue becomes the timing of such a statement. Judge Wright reaffirms his previous conclusion that "NEPA requires predictions, not prophecy." 20/ But, "on the other hand of the spectrum, by the time commercial feasibility of the technology is conclusively demonstrated, and the effects of applications of the technology certain, the purposes of NEPA would have already been thwarted."21/

With some of these initial considerations in mind, Judge Wright does state certain questions that need to be answered prior to determining whether such a statement is necessary. He recognizes that "statements must be written late enough in the development process to contain meaningful information, but they must be written early enough so that whatever information is contained can

---

18/ Ibid.

19/ 481 F.2d at 1093 (D.C. Cir. 1973)

20/ 481 F.2d at 1093 (D.C. Cir. 1973)

21/ Ibid.

practically serve as an imput into the decision making process." [22] Following the recognition of this balance the factors he considers important are "how likely is the technology to prove commercially feasible and how soon will that occur? To what extent is meaningful information presently available on the effects of application of the technology and alternatives and their effects? To what extent are irretrievable commitments being made and options precluded as the development program progresses? How severe will be the environmental effects if the technology does prove commercially feasible?" [23] Also of particular significance is that Judge Wright appears to recognize the need for agency discretion in making these determinations, but in the present case, Judge Wright concludes, "the Commission has not given reasons for its decision." [24] This in my judgment is particularly significant in analyzing this opinion. It has always been a basic principal of administrative law that an agency needs to make a record to support its decision in order for a court to properly review whether there is a rational basis for such a decision. Without such a record, the court on its own needed to review if in fact a record existed which indicated if the Commission had a program. Indeed, it made projections through the year 2000 [25] and had prepared a 10 volume program plan. [26]

---

[22] *Ibid.*

[23] 481 F.2d at 1094 (D.C. Cir. 1973)

[24] *Ibid.*

[25] 481 F.2d at 1097 (D.C. Cir. 1973)

[26] Ibid.

Thus, the CEQ guidelines developed for a research and development program as well as the general considerations previously discussed which in my judgment are of particular significance is the need for the agency to make its own record as to why such a statement is not necessary and if in fact it can justify its decision.

Apparently, the District Court in *Sierra Club v. Morton*, 27/ felt that such a record existed. In that case, the Sierra Club and other environmental organizations attempted to take the language in the *Sippi* case further and argued that the Department of the Interior and other agencies could not approve various coal-related activities individually, even assuming environmental impact statements were written for the individual projects, without drafting a comprehensive environmental impact statement covering the entire potential coal development in the "Northern Great Plains Region", i.e., Montana, Wyoming, North Dakota, South Dakota and Nebraska. The District Court rejected that argument on the basis of various governmental affidavits (i.e. an administrative record), indicating that there was in fact no program, "that the Northern Great Plains region as described by the plaintiffs is not an entity, region, or area which has been defined by the Federal Government by statute or executive action for purposes of any Federal program, project, or action," 28/ that each action would be the subject of an environmental impact statement and that there was no irreparable and irretrievable injury involved to the various environmental

---

27/ Civil Action 1182-73 decided on February 14, 1974, *appeal pending*.

28/ *Ibid*, slip op. at 4.

groups. The Court concluded, "Even if there were some regional federal program....., NEPA would not prohibit federal action upon an individual project within the "region" on the basis of an environmental impact statement prepared for that project prior to the completion of the regional program."29/

The appeal was heard on December 17, 1974. On January 3, 1975, an injunction was issued prohibiting action by the Secretary of the Interior on mining plans and railroad right-of-ways set forth in the Eastern Powder River Coal Basin Environmental Impact Statement pending disposition of the appeal. There was a strong dissent by Judge McKinnon. If the injunction is an indication of the final decision, this case will be extremely significant because of its substantial effect on western coal surface mining, not to mention the law with respect to programatic statements. A similar action has been brought by the Environmental Defense Fund arguing for the need for a comprehensive environmental impact statement covering coal related water development in Montana and Wyoming, which is still in the complaint stage, and raises the same basic issues as Sierra Club v. Morton, 30/ this time with respect to water development in the Western area. 31/

29/ Ibid, slip. op. at 17

30/ Ibid.

31/ EDF v. Morton (Case No. 1220, filed Oct. 24, 1973 CD Mont.)

Other courts have dealt with the question of allowing projects to go forward that may have some connection with broader regional determinations. In Jicarilla Apache Tribe of Indians v. Morton, 32/ the factors which the Ninth Circuit indicates are significant in making a determination as to the necessity of additional study, besides the possibility of additional information, are "the consequences of delay, the present state of information concerning the environmental factors, and the degree of probative value and relevance of the information which may be gained by delay." 33/

In Sierra Club v. Stamm, 34/ the Sierra Club attempted to block construction of the Bonneville Unit of the Central Utah Project by arguing that an environmental impact statement prepared by the Department of the Interior was "too narrow in scope, and should be a comprehensive and final statement on all units (both initial and ultimate phases) of the Central Utah Project."35/ Noting that the Strawberry Acqueduct and collection system at the Bonneville Unit could operate independently of the other units and that individual impact statements were to be prepared covering other phases of the Central Utah Project, the Court held:

> To require a single environmental statement on all the units of the Initial Phase, and the Uintah Unit and Ute Indian Unit of the Ultimate Phase would

---

32/ 471 F.2d 1275 (9th Cir. 1973)

33/ 471 F.2d at 1281 (9th Cir. 1973)

34/ 6 ERC 1848 (D. Utah 1974), aff'd 7 ERC 1245 (10th Cir. 1974)

35/ 6 ERC at 1850 (D. Utah 1974), aff'd 7 ERC 1245 (10th Cir. 1974)

> simply bring the entire development by Utah of its allotted share of Colorado River water to a halt, even though, the court finds, there is an immediate and critical need for water. On these large projects which are to be constructed in successive phases or stages over a long period of years, the comprehensive development cannot as a practical matter be evaluated at a single moment in time, because the latter phases are in such a preliminary planning stage that an attempt at assessment of future environmental consequences from construction of a project not yet designed would be sheer guesswork. 36/

In Sierra Club v. Callaway, (Wallisville Dam) 37/ the Fifth Circuit reversed the massive opinion below 38/ and determined that the environmental impact statement for the Wallisville Dam did not have to include the environmental impact of the entire Trinity River Project. The Court did indicate, "Since Wallisville is located at the mouth of the Trinity River, common sense and economy dictate that it be made compatible with the Trinity Project. It does not follow, however, that compatibility is necessarily antipathetical to the separateness of the two projects, if otherwise they should be treated as separate projects within the context of NEPA."39/ The Court also noted that construction and funding had been authorized for the Wallisville Dam but no construction or funding had been scheduled for the Trinity River. The Court stated with respect to the Trinity River Project, "its ultimate completion is not a certainty, but depends on the wisdom and judgment, if not the moods and whims,

---

36/ 6 ERC at 1852 (D. Utah 1974), aff'd 7 ERC 1245 (10th Cir. 1974), Accord: Trout Unlimited v. Morton, 7 ERC 1321 (9th Cir. 1974)

37/ 499 F.2d 982 (5th Cir. 1974)

38/ 359 F. Supp. 1289 (D. Tex. 1973)

39/ 499 F. 2d at 987 (5th Cir. 1974) See also Trout Unlimited v. Morton, 7 ERC 1321 (9th Cir. 1974) of Congress. It has changed its mind before as respects the Trinity Project, and might well do so again. In contrast Wallisville is 72% complete and once construction is resumed can be completed in a relatively short period of time." 40/

In contrast, in Atchison, Topeka and Santa Fe v. Callaway, 41/ the issue of segmentation was presented with respect to the first component of a massive 3.2 billion dollar Upper Mississippi River navigation system, beginning with Locks and Dam 26. The Government argued that based on the Wallisville Dam case, the impact statement need only consider the Locks and Dam 26 rather than the entire project. The District Court rejected that position stating that as they interpreted the Wallisville Dam decision "the issue of segmentation should be decided on a case by case basis considering the factors of the scope of project, the timing of the project, and the interdependence of the project to the overall program." 42/ Then, looking at the facts, in the present case, the Court stated that Locks and Dam 26 "is the largest project undertaken in the midwest and will cost over $383 million dollars - a major expenditure of public funds to say the least." 43/ The Court also noted that this decision was "in essence, the decision to expand the capacity of the entire system.

40/ 499 F. 2d at 988 (5th Cir. 1974)

41/ 7 ERC 1016 (D.D.C. 1974)

42/ 7 ERC at 1023 (D.D.C. 1974)

43/ Ibid.

It is this decision that will necessitate the improvement of other segments of the system. Thus, Locks and Dam 26 is to the other parts of the Upper Mississippi system what the Trinity River Project is to the Wallisville Project, not visa-versa." 44/ The Court also noted as compelling, "the proposed Locks and Dam 26 is just on the verge of implementation as opposed to the Wallisville Projects which is near completion."45/

Regional or programatic statements alone may not be sufficient to assess individual projects. In Natural Resources Defense Council, Inc. v. Morton, 46/ the Natural Resources Defense Council argued that even though the Bureau of Land Management (BLM) was in the process of completing a programatic impact statement for the entire grazing program, it must prepare environmental impact statements for narrower units such as a district. The Court agreed with the plaintiffs, noting, "The proposed EIS does not provide the detailed analysis of local geographic conditions necessary for the decision maker to determine what course of action is appropriate under the circumstances."47/ The Court also noted that by taking solely a programatic approach, there is no vehicle left for input on individual permits by states and local citizens. 48/ The Court distinguished Natural Resources Defense

---

44/ Ibid.

45/ Ibid.

46/ Civ. Action No. 1982-73, D. D. C., decided December 30, 1974.

47/ Ibid, slip. op. at 16.

48/ Ibid, slip. op. at 16-17.

Council, Inc. v. Tennessee Valley Authority 49/ where the Court held that individual TVA contracts need not be the subject of an environmental impact statement on the assumption that the filing of such statements would conflict with bidding requirements of the TVA Act and that TVA had a strict set of environmental regulations dealing with these individual contracts. 50/

The Court also stated, "It will be initially within the BLM's discretion to determine whether to make this specific assessment in a separate impact statement for each district, or several impact statements for each district, or one impact statement for several districts or portions thereof, or indeed by other means. So long as the actual environmental effects of particular permits or groups of permits in specific areas are assessed, questions of format are to be left to defendants." 51/

Other actions dealing with project and programatic impact statements include an action unsuccessfully brought to prevent the federal offshore sale in Florida based on the issue that the Government had not developed an environmental impact statement on broad scale offshore leasing. 52/ Note, that the Government recently announced that

---

49/ 367 F. Supp. 122 (E.D. Tenn. 1973).

50/ Ibid, slip. op. at 13, 17.

51/ Ibid, slip. op. at 21.

52/ Sierra Club v. Morton, No. 73-629-Civ.-T-H (M.D. Fla. 1974), appeal pending a broadbased type of impact statement will be written for various offshore areas that will be leased in the future, followed by individual impact statements for the specific areas. 53/

Similarly, following the filing of the action in Sierra Club v. Morton, 54/ the Government determined to write, and has completed a final impact statement covering various coal-related facilities in Eastern Wyoming. (Eastern Powder River Coal Basin Environmental Impact Statement) and has also completed a draft impact statement on the federal coal leasing program.

II. Adequacy of Data

A related problem in programatic or regional statement is the difficulty of adequacy of data and the continuing data gathering that is a basic function of development.

In Jicarilla, 55/ the issue was framed in terms of the adequacy of an impact statement covering the Four Corners Project in the absence of data from a regional energy study which had not yet been completed. The Ninth Circuit rejected the contention that the individual impact statement was invalid as a basis for federal action noting that, "Neither §102(2)(B) nor

---

53/ 39 Fed. Reg. 17777, May 20, 1974. This concept has been unsuccessfully challenged by the State of California in State of California v. Morton. (C.D. 74-2374 AA California, decided January 6, 1975)

54/ Civil Action 1182-73, D.D.C. decided February 14, 1974, appeal pending.

55/ Jicarilla Apache Tribe of Indians v. Morton, 471 F.2d 1275 (9th Cir. 1973)

(C) [of NEPA] can be read as a requirement that complete information concerning the environmental impact of a project must be obtained before action may be taken. If we were to impose a requirement that an impact statement can never be prepared until all relevant environmental effects were known, it is doubtful that any project could ever be initiated." 56/ The Court also rejected an invitation to substitute its judgment for that of the Secretary of the Interior as to the type of information that might be required to complete the impact statement. "What appellants seek is for this Court to substitute its judgment for that of the Secretary... We decline to assume that role." 57/

Environmental Defense Fund, Inc. v. *Armstrong*, 58/ involved the Environmental Defense Fund arguing that the environmental impact statement for the New Melones Dam Project should be delayed pending the initiation and completion of a "comprehensive study of the Central Valley Project." 59/ The Court's response, citing *Jicarilla*, was as follows:

> "Here, no comprehensive study had been commenced, let alone completed. Under these circumstances, there is no requirement under NEPA that the EIS with respect to the New Melones Project be delayed until a comprehensive study of the Central Valley Project be completed... Plaintiff's suggestion that there is a need for a comprehensive study of the Central Valley Project should be made to the Congress and not to the Court." 60/

56/ 471 F. 2d at 1280 (9th Cir. 1973)

57/ *Ibid*

58/ 356 F. Supp. 131 (N.D. Cal. 1973), *aff'd* 487 F.2d 804 (9th Cir. 1973)

59/ 356 F. Supp. at 139 (N.D. Cal. 1973), *aff'd* 487 F.2d 804 (9th Cir. 1973)

60/ *Ibid.*

In Environmental Defense Fund, Inc. v. Corps of Engineers of the United States Army, 61/ the adequacy of an environmental impact statement for the Tennessee - Tombigbee Project was challenged in part on the basis that "detailed investigations of environmental matters were to take place in the future". 62/ The Court rejected that argument noting that the "mere existence of a continuing program to minimize environmental damage and maximize benefits should never be allowed to rule out the possibility of initial compliance." 63/ and that the impact statement was adequate "to enable those who did not have a part in its compilation to understand and consider meaningfully the factors involved." 64/

Two other courts of appeals have raised no objection to an agency approval of a proposed project after considering an environmental impact statement based on acknowledged "interim" data while at the same time undertaking investigations necessary to acquire more definitive information. 65/

III. Summary

While the various cases that I have discussed today appear to go off essentially on their limited facts, there does, however, appear to be some

---

61/ 492 F. 2d 1123 (5th Cir. 1974)

62/ 492 F. 2d at 1131 (5th Cir. 1974)

63/ 492 F.2d at 1130 (5th Cir. 1974)

64/ 492 F.2d at 1136 (5th Cir. 1974)

65/ Ecology Action v. United States Atomic Energy Commission, 492 F.2d 998, 1002 (2nd Cir. 1974); Union of Concerned Scientists v. AEC (D.C. Cir., No. 73-1099. decided June 10, 1974)., slip op. 24-30.

continuing trends. The Courts appear to have recognized the need for initial agency discretion in determining the scope of the project so long as the agency exercises this discretion in what is again the basic framework of administrative law, namely to make a record to support that position. 66/

The Courts also attempts to examine the present state of the project i.e., whether it has been somewhat along in construction and the consequences of additional delay in order to prepare a regional or programatic statement. 67/

Similarly, the Programatic Statement itself may not be sufficient to cover individual actions within the program or region. 68/ The cases appear to recognize the distinction between readily available data and data that will be developed in the future, at the same time requiring some form of reasonable prediction. 69/

66/ See Scientists' Institute for Public Information, Inc. (Sippi) v. AEC, 481 F.2d 1079 (D.C. Cir. 1973); Sierra Club v. Morton, D.D.C. Civil Action No. 1182-73, decided February 14, 1974; Jicarilla Apache Tribe of Indians v. Morton, 471 F.2d 1275 (9th Cir. 1973).

67/ Sierra Club v. Stamm, 6 ERC 1848 (D. Utah 1974), aff'd. 7 ERC 1245 (10th Cir. 1974); Sierra Club v. Callaway, 499 F.2d 982 (5th Cir. 1974) See also Atchison, Topeka & Santa Fe v. Callaway, 7 ERC 1016 (D.D.C. 1974); Sierra Club v. Morton, (D.D.C. Civ. Action 1982-73 decided February 14, 1974).

68/ Natural Resources Defense Council v. Morton, D.D.C. Civ. Action No. 1982-73, decided Dec. 30, 1974.

69/ Jicarilla Apache Tribe of Indians v. Morton, 471 F.2d 1275 (9th Cir. 1973); Environmental Defense Fund Inc. v. Armstrong, 356 F. Supp. 131 (N.D. Cal. 1973), aff'd. 487 F.2d 804 (9th Cir. 1973); Scientists' Institute for Public Information, Inc. v. AEC, 481 F.2d 1079 (D.C. Cir. 1973); Sierra Club v. Morton, D.D.C. Civ. Action No. 1982-73, decided February 14, 1974.

Many of the problems in this area are yet to come. The scope of energy related programs and regions will continue to be argued.

Perhaps the key to this kind of determination is a question of making a determination, for example, of whether to go forward with one coal mine is in fact an irretrievable commitment to be made to go forward with coal mining in a 5 or 10 or 20 state area. Clearly, the answer to this question is no, or for that matter, is a commitment to go forward on one oil shale plant a commitment to go forward on regional development? Again, I would argue that the answer is no. Data will continue to improve and means of avoiding environmental damage will also continue to improve even if there is a regional or programatic impact statement. I am not saying, however, that Programatic or Regional Statements should not be written. Indeed, they do serve a purpose as an overall study. My question, however, is whether such overall programs or studies should necessarily be in the framework of NEPA. Studies will continue to be made and facts should be gathered regardless of whether they are done for the purposes of NEPA or simply to give the government a continuing ongoing basis for judgment. Allowance of individual projects to go forward pending additional studies is the key. In my judgment, the District Court's position in Sierra Club v. Morton that NEPA would not prohibit a Federal action upon an individual project "on the basis of an environmental impact statement prepared for that project, prior to completion of the regional program", [70] is recognition that individual projects do not necessarily result in massive additional projects and, at any rate, the future projects are also controlled by NEPA. At the same time, I submit that courts in reviewing efforts to prevent individual or limited projects in the meantime should carefully weigh the factors considered in Jicarilla, namely "the consequences of delay, and the present state of information concerning the environmental factors and the degree of probative value and relevance of the information which may be gained by delay." [71]

In closing, a point of history is significant in considering these matters. In the 1930's, great effort was made to invest existing agencies with discretion and create new administrative agencies with discretion in order to circumvent the courts which it was felt were thwarting social progress. Now, apparently, there is a strong feeling that it is the agencies that are preventing social progress, and it is the courts which should make the determination through the vehicle of a "rigorous" review of questions of fact. [72]

---

[70] Civil Action No. 1182-73, D.D.C., decided February 14, 1974, slip. op. 15. See also Florida Audubon Society v. Callaway, 6 ERC 1320, 1327 (M.D. F.19, 1974), Indian Lockout Alliance v. Volpe, 484 F.2d 11 (8thCir. 1974); Movement Against Construction v. Volpe 361 F. Supp 1360 (6 MD. 1973).

[71] Jicarilla Apache Tribe of Indians v. Morton, 471 F.2d at 1281 (9th Cir. 1973)

[72] See for example, Robie, Recognition of Substantive Rights Under NEPA, 7 Nat. Res. L. 387 (Summer 1974)

Perhaps the concept of neutral principles of law needs to be considered, namely that a principle should cut both ways. Consequently, if it is considered a basic principle of law that the agency is to make initial determinations, and that the determination should not be overturned if there is a rational basis, coupled with the rule in Overton Park [73] of whether the "decision was based on a consideration of the relevant factors, and whether there has been a clear error", [74] we ought to do some rethinking in terms of how we view the functions of the agencies and the courts. It was the feelings in the 1930's, that the courts were making judgments requiring technical expertise and understanding of social policies that they did not possess. If the assumptions which lead to greater discretion in various federal administrative agencies are still applicable, then Courts should continue to recognize these basic principles of administrative law. [75]

---

[73] Citizens to Preserve Overton Park v. Volpe, 401 U. S. 402 (1971)

[74] Id. at 416

[75] Judge Wright's dissent in Ethyl Corporation v. EPA, 7 ERC 1353, 1402 (D.C. Cir. 1975) is particularly interesting on this point. Judge Wright, has been critized for allegedly substituting his judgment for that of administrative agencies, argues that the majority substituted their judgment for the Administrator of the Environmental Protection Agency (EPA) in setting aside EPA lead regulations. Some would argue that this case is an instance of Judge Wright being "hoisted on his own petard."

SECONDARY EFFECTS (?) OF ENERGY DEVELOPMENT PROJECTS

by Jack G. Collins[1]
First Assistant United States Attorney
for the District of Oregon

For Presentation to the Regional Energy EIS Meeting
Denver, Colorado -- March 6, 7, 1975

Mr. Chairman, Ladies and Gentlemen,

I am most grateful for the opportunity to join with you in considering how we shall manage a portion of our natural resources.

A small but noisy part of this management is my daily concern. I am an Assistant United States Attorney for the District of Oregon. I represent the United States, its Departments and most of its agencies in the Federal and State courts of Oregon, both as plaintiffs and as defendants.

The United States owns about 52 percent of the land in the State of Oregon. It also has large programs there for management of natural resources, including production of energy. As you might expect, we spend a good deal of our time as lawyers in court in litigation relating to these public lands and programs.

---

[1] Member, Oregon State Bar. A.B. Princeton University (1952); L.L.B. Harvard University (1958); First Assistant United States Attorney, Portland, Oregon. The views expressed in this paper are those of the author and do not necessarily reflect the views of the United States Department of Justice.

My view of our problems relating to management of public lands and resources is, as you might expect, from the arena of the trial courts. These trial courts are places of increasing pressure for time and the demands of litigants.

One of our problems as litigators that may be of interest to you is the way in which we pose and attempt to answer the question "How much study is enough?" If we throw a pebble in a pond, how far must we watch its expanding and then overlapping ripples? Indeed, how far will they expand and overlap? Are environmental impact statements ever adequate without the final and definitive answer?

At the outset we know that there can be no such final definitive answer because we cannot know the future as we know the present and the past. We are simply not built that way, and it is probably a good thing. Of course, I am sure that the sun will rise tomorrow; but I only know that on the basis of the present and the past. Indeed, we are told that at some future time it will not. Of course, we have elaborate methods for predicting with increasing accuracy what the future will be. My friends who are economists and mathematicians delight in regaling me with esoteric names involving "game theory", "input-output analysis" and the great discipline of quantum mechanics. These systems, however, are used principally to predict the future; they cannot give it certainty.

At this point you may well ask what all this has to do with the preparation of environmental impact statements. The relevance is this. If we understand and accept that we are only making predictions, then what we are really arguing about is the percentage of error in those predictions. If we accept that, then it is only one step further to ask if the risk of error that is being run is unreasonable. Our courts and juries make these kind of decisions all the time. Our juries decide if defendants in criminal cases are guilty beyond a reasonable doubt. Our juries decide in civil litigation if one party will be required to pay another damages by a preponderance of the evidence. Our courts apply equitable jurisdiction and continually balance equities.

In preparing a case for the government, either as plaintiff or defendant, we continually ask ourselves, "How high is the degree of certainty in the judgment that our resource managers have taken?" "How small is their percentage of error?"

These questions, however, are a product of our linear realty of time and history. Our environmental impact statements and indeed most of western industrial society are built upon this framework of reality. There are, however, those who speak from a different reality characterized by a singleness or unity of events and an absence of time.[2] John Muir and Aldo Leopold have left us in their writings environmental impact statements premised upon this other holistic reality. There are no "secondary effects" in this other timeless unitary world.

Most of us, however, work in a world of time and history. Our problems with "secondary effects" are part and parcel of our attempts to quantify the degree of certainty which can be found within this framework.

These problems often appear more difficult in the energy field because the generation, distribution and eventual use of energy are often widely separated among different ownerships, only some of which may be subject to public control or investigation. In addition, recent studies of the energetics of ecological systems has given us a new way of looking at the world.[3] It is from such analyses that we have come to realize that industrial man no longer eats potatoes made from solar energy, but rather he eats potatoes partly made of oil.[4]

---

[2] See Science and Human Understanding, J. R. Oppenheimer, Simon and Schuster, New York, 1966, p. 69.

[3] See Environment, Power, and Society, Howard T. Odum, John Wiley & Sons, Inc., 1971.

[4] Odum, supra, p. 116.

We realize that our use of the term "secondary effects" is merely an arbitrary means of bracketing a portion of the spectrum of possible future events. I have thought that the term was borrowed from our water treatment technology where the terms "primary", "secondary" and "tertiary" treatment are generally used to describe kinds of facilities and treatment which remove increasing percentages of pollution. Our use of the terms "direct" and "indirect" effects is another attempt at distinguishing a portion of a continuous spectrum of events.

The amount and kind of treatment that should be given "secondary effects" in environmental impact statements may itself be a question that has no certain answer. It would not surprise me to find that our concern about the discussion of "secondary effects" in environmental impact statements is directly proportional to the degree of certainty of such effects--the more likely a future event, the more likely we are to find it discussed. But that may not be true and it may even be dangerous. I am sure you can think of examples.

The Courts are wise enough to avoid imposing any type of mathematical certainty upon this problem. They will probably settle upon a kind of "rule of reason" that will insure employment for an increasing number of lawyers. Such a "rule", however, will also allow a useful flexibility in our social fabric.

A recent example from the Northwest may be interesting. Recently the Sierra Club commenced an action in the United States District Court for the Western District of Washington in Seattle, against the Administrator of the Bonneville Power Administration[5/] in which plaintiffs sought to enjoin the Administrator from furnishing electrical power to a magnesium-ferrosilicon plant presently under construction near Addy, Washington, by a subsidiary of the Aluminum Company of America. Plaintiffs alleged that the Administrator had not complied with the Clean Air Act, 42 U.S.C. § 1857, *et seq*. and the National Environmental Policy Act, 42 U.S.C. § 4331, *et seq*., as well as Executive Order 11514, 35 F.R. 4247.

The gist of plaintiffs' NEPA claim is that the Administrator's environmental impact statement was inadequate because it was addressed to the construction of the transmission line and substation and not to the "secondary" effects which might arise from the use of electrical energy at the Addy plant. There was a brief treatment of these effects which the Administrator believed adequate in view of the limited nature of the Federal action. The Court held that the Administrator's impact statement did adequately

---

[5/] *Sierra Club* v. *Hodel*, ___ F.Supp. ___ (W.D. Wash., Civil No. 740-73C2).

cover the Federal action (construction of the transmission line and substation). The Court noted that Bonneville's power contract conditioned the provision of electrical service upon compliance with all legal requirements relating to pollution control. The State of Washington Department of Ecology had previously conducted its own study and prepared a lengthy environmental impact statement prior to its licensing of the proposed plant. Alcoa's application for surface mining permits had been evaluated by the State of Washington Department of Natural Resources. On December 12, 1973, the Stevens County Planning Commission released its own environmental impact statement; and on December 17, 1973, the County Commissioners wrote to Alcoa approving construction of the plant.

On November 12, 1974, the United States District Court for the Western District of Washington reaffirmed a prior order which had denied plaintiffs' relief and dismissed their action. In doing so the Court held that this suit against the Administrator was one step removed from either the proper parties defendant or the correct issues. Specifically, the Court found that plaintiffs' allegations as to air pollution ". . . do not assert pollution to be caused by, or even properly attributable, directly or indirectly, to the activities of this defendant." The Court went on to note that although the Clean Air Act creates a private right of action (42 U.S.C. § 1857h-2) such authorization was only against those who are alleged to be in violation of an emission standard or limitation under the Clean Air Act or an order issued with respect to such standard or limitation. No such allegations of the existence of an emission standard or order of their violation were made. Accordingly, that claim was dimissed.

With respect to the plaintiffs' claim that Bonneville's NEPA statement was inadequate because it did not adequately consider the secondary effects of the delivery of electrical power service to the privately owned plant, the Court held that the Administrator was not required to duplicate the previous impact statements of State and County agencies. The Court went on to hold that the Administrator does not have the licensing or regulatory authority over Alcoa's operations. Finally, the Court held that Bonneville's power supply relationship to the plant was not sufficient to characterize the plant operations as part of a Federal project.

A somewhat similar problem was dealt with by the District Court in Natural Resources Defense Council v. T.V.A., 367 F.Supp. 128 (E.D. Tenn., 1973) in which plaintiff challenged an environmental impact statement on grounds that it did not adequately treat various sociological impacts of strip mining. The Court remarked that to conduct the various sociological studies as suggested would take years. See 367 F.Supp. 128 at 133. The Court noted that the National Environmental Policy Act only requires a discussion of reasonable alternatives. See 367 F.Supp. 128 at 123.[6/]

But the Courts often employ a different emphasis. Thus in Natural Resources Defense Council, Inc. v. Morton, 458 F.2d 827 (C.A.D.C., 1972), in which the environmental impact statement prepared by the Department of the Interior on the sale of oil and gas leases in the Gulf of Mexico was challenged. The Court found that the consideration of alternatives was inadequate and held that all reasonable and viable alternatives must be considered, even if some of those alternatives were outside of the agency's authority. In this instance, the statement did not discuss the elimination of oil import quotas to increase the fuel supply. The Court noted that "while the Department of the Interior does not have the authority to eliminate or reduce oil import quotas such action is within the purview of both Congress and the President, to whom the statement goes." The Court continued:

6/ Chief Judge Beeks remarked in Brooks v. Volpe, 350 F.Supp. 269 at 277 (W.D. Wash., 1972) that "Litigants must not be allowed to use NEPA as a tool to destroy federal programs under the guise of interest in the environment." See also 17 ALR Fed. 1.

"The impact statement is not only for the exposition of the thinking of the agency, but also for the guidance of these ultimate decision-makers, and must provide them with the environmental effects of both the proposal and the alternatives, for their consideration along with the various other elements of the public interest."

In holding that impact statements for highway development programs must include the entire program rather than one portion, the Court of Appeals for the 2d Circuit noted that NEPA requires Federal agencies to recognize the world-wide and long-range character of environmental problems and that environmental factors are to be considered "to the fullest extent possible." The Conservation Society of Southern Vermont v. Secretary of Transportation, ___ F.2d ___ (C.A.2, Dec. 11, 1974).

Department of Transportation regulations specifically provide that secondary and other foreseeable effects, as well as primary consequences for the environment should be included in the analysis. See F.R. Vol. 39, No. 190, September 30, 1974, page 35242. The Corps of Engineers regulations provide for the broadest consideration of project effects. See 33 CFR 209.400.

What can we draw from all this?

First, some degree of prediction among alternatives will be required. The agency must consider, not only effects which it knows will occur, but also potential effects. The amount of prediction is subject to a rule of reason and good faith.[7]

Second, in Hanly II,[8] the Court established two criteria for measuring the significance of a project's environmental impact:

> (1) The extent to which the action will cause adverse environmental affects in excess of those created by existing uses in the area affected by it, and
>
> (2) The absolute quantitative adverse environmental effects of the action itself, including the cumulative harm that results from its contribution to existing adverse conditions or uses in the affected area.

Since these criteria are rather specific, it would be helpful to your litigators if agencies expressly referred to them in making determinations of the significance of the environmental impact of a project.

Third, is the increasing emphasis which the concept of the "human environment" as contained in NEPA will be given. In a case from San Diego[9] the Court agreed that the ecological effects of building a youth

---

7/ See SIPI v. AEC, 481 F.2d 1512 (C.A. D.C., 1973); Life of the Land v. Volpe, 363 F.Supp, 1171 (D. Hawaii, 1973), aff'd 485 F.2d, 460 (C.A. 9, 1973).

8/ Hanly v. Kleindienst, 471 F.2d 823, 830-831 (C.A.2, 1972), cert. denied, 412 U.S. 908 (1973).

9/ Tierrasanta Community Council v. Richardson, 6 ERC 1065, 1068 (S.D. Calif., November 6, 1973).

reformatory in a residential area were not significant but held that the sociological and psychological impact on the surrounding community could have a significant effect on the human environment and the failure of the agency decision-makers to consider those effects rendered their threshold determination of no significant impact arbitrary and capricious. In Goose Hollow Foothills League v. Romney, 334 F.Supp. 877 (D. Ore., 1971) the Court noted that a change in the character of a neighborhood would be a significant effect requiring an environmental impact statement. As NEPA is increasingly used to challenge urban building and redevelopment projects, the increasing importance of the concept of the "quality of the human environment" is evident.

I have two final suggestions.

First, let us recognize and return political questions to the proper political forum.

We ask too much of our Administrators. They are asked to do more than execute the policies and programs of our local, State and Federal legislatures. Too often they are asked to establish priorities for the use of natural resources which are more properly the decision of the body politic. The use of energy stored in shale, lignite, and gas reserves should be the decision of our whole people and should be made through our national political process. In the course of that process the full ambit of environmental investigation required may be considered.

In the meantime decentralized field offices should not be required to explore the national and world-wide ramifications of their impact upon a much wider national problem. For example, in Oregon the Forest Service sells government timber. Must it consider in determining the environmental impact of sale of several hundred acres of timber what the effect on the total allowable national cut of timber in the United States will be? Must it do this every time it sells timber? Clearly it should not. The decision as to how much timber should be cut in the United States in any given year is a national question.

Perhaps we can distinguish between these program and policy problems and those which involve a particular project. I have heard the former program and policy problems referred to as "generic" questions. Perhaps the Council on Environmental Quality will suggest in its guidelines that such questions need not be considered each time the Federal Government sells timber in Oregon.

My second and final suggestion is that we return to the land. At the outset I must admit to you a certain admiration for Mr. Ian McHarg.[10/] Let us begin

---

[10/] See Design with Nature, Ian McHarg, American Museum of Natural History, Natural History Press, New York 1969.

with land inventories. The Forest Service has already begun such a program. On several of our large national forests in Oregon planning units have been established which generally follow contours of natural drainages. Extensive inventories of the topography, geology, flora, fauna, water quality and many other matters are inventoried in a computer and prepared for matrix analysis. Out of such attention to the land the Forest Service hopes to answer the question, "What will this land support?" The Forest Service expects to be able to rank alternatives for use. I suggest that the priority among such alternative uses may be for Congress. Environmental impact statements, however, flow rather naturally from such planning units.

If our energy development agencies are to undertake a similar program, it may be necessary to amend their enabling legislation. This may be so because they may become the pre-eminent land-use planners by virtue of their generation and distribution of energy.

I am not sure if I am prepared to delegate to a single national energy board or even regional energy authorities the power to inventory our land in terms of its energy producing potential coupled with the power to rank that potential in terms of its ultimate use. I am not sure that I would permit a development of our land by energy authorities under broad and vague categories of an energy multiple-use sustained yield act.[11] Are you?

---

[11] See 16 U.S.C. § 528, *et seq*.